



Bulk Rate
U.S. Postage
PAID
Chattanooga, TN
Permit No. 357

Color Micro JournalTM

The Color Computer Monthly Magazine

\$1.95 per issue Vol. 1, Issue 4 December, 1983

THIS 'N THAT

OS-9 Users Group

An **ACTIVE** and **ORGANIZED** Users Group provides a tremendous boost to any product, and we are extremely pleased to see that the **OS-9 Users Group** has all of the features normally found in the more successful Users Groups across the country. It has the **FULL** and **ACTIVE** support of the producer of the product, in this case, **Microware Systems Corp.**; it has a centralized meeting location in conjunction with the annual **OS-9 Seminar** sponsored by **Microware**; and it is a well organized Group with strong and well known leadership in people like Pres. Dale Puckett (who writes the **KISSable OS-9 Column** in **Rainbow Magazine**) and Vice Pres. Peter Dibble (who writes the **OS-9 Users Notes Column** in '68' **Micro Journal Magazine**), to mention a couple that you are probably familiar with.

The **OS-9 Users Group** publishes a Newsletter, and the Software Library is now on-line. Initial plans are to provide a "standard selection" of Software to each New Member, while other Programs will be available for a nominal fee or in exchange for further Library Submissions. An active Users Group can play a large part in developing "Standards" within the Industry, as well as providing a fertile base for rapid but controlled expansion and growth within that Industry.

One problem I hope the **OS-9 Users Group** can eliminate or control is the wide variety of "DEFS" Files floating around the **OS-9 Community**; I presently have over 25 DIFFERENT "DEFS" Files on three different Computer Systems with **OS-9 Op Systems**. If I try to assemble

Continued on page 7

OS-9 TIPS

Tired of hearing your disk drives step at 30ms when you paid more to get 6ms drives? Relief is just a quick debug session away. Want to split that label away from the instruction and add a new instruction at the label location? Read on, these things and more will be explained in this article.

Unfortunately, the user of OS9 cannot use any of his existing FLEX or R/S DOS software with his OS9 operating system. If you want a challenge, you can dump modules to the printer and try to figure out how all the OS9 utilities work, like I have been doing.

I am sure by now most OS9 users have discovered that Tandy has continued the now famous tradition of producing documentation without the aid of proof readers. This makes the challenge twofold, you get to figure out what the documentation is trying to tell you in addition to figuring out how the utilities work. Contrary to what you might have hoped, these two things are not always the same.

A good example of confusing documentation is found in the **Getting Started with OS9** book. Notice the last paragraph on page 14. You are told to remove the "blank disk from Drive 0", the very same blank disk you were told to put in Drive 1 in step 2 at the top of the page. Enough criticism, let's get on with the tips you are reading this article to learn about.

Speed up drive step rate to 6ms:

Although the architecture of OS9 allows separate step rates for the different drives in your system, the CDDISK module does not utilize the step rate field in device descriptors. The OS9 technical information manual offers good explanations of the device descriptors. My first attempts at setting 6ms step rate involved patching the device descriptors, D0 and D1, for drives 0 and 1.

After stumbling through bad CRCs and other things I found the changed descriptors to have no effect on the step rate. I knew from prior exper-

Continued on page 6

Price \$16.50 per year, \$1.95 per copy
Color Micro Journal is published monthly by Computer Publishing Inc., 5900 Cassandra Smith Rd., Hixson, TN 37343. **POSTMASTER:** Send address changes to **Color Micro Journal**, 5900 Cassandra Smith Rd., Hixson, TN 37343. For change of address: Six weeks notice to **Subscription Dept.**, 5900 Cassandra Smith Rd., Hixson, TN 37343. Give old and new address and zip code. If possible enclose address label from cover of previous issue.

COMPUTER OPERATING SYSTEMS

General

Computer Systems have come a long way in the last thirty years. The first Computers required an operator to have a **DETAILED** working knowledge of both electronics AND the Machine Language of the Computer to get it to operate. Now days if you know the English Language, you can run a Computer. Although the advancements

Continued on page 12

This Month

Editorial

This 'N That 1

Article

OS-9 Tips; Useful Operating Hints - Aker. 1
Computer Operating Systems; Part 1 - staff 1
Linking Loader for RS & CoCo
FLEX (Pt. 2) - Waggoner 26

Hardware

CoCo 2 Hardware Notes;
- Rosen 9
WHERE is the Computer NOW??;
- Pass 18

Programs

BASLIST/BAS; a BASIC "Pretty-Printing Program - Deal . . . 19
OPSLII Clarification of last months MICROBOOKS Discussion
- LaLone 22
X-Y Plots with the MX80; a Basic89 Program - Strunk. . . 22

Reviews

the Complete Personal Accountant
- LaLone 2
ROC-1; a CoCo Disk Controller
- staff 20



12

0

the Complete Personal Accountant

programmer's institute

P.O. Box 3470
Chapel Hill, NC 27514
(919) 967-0861

Req. Extended BASIC and at LEAST 16K
Tape - \$74.95; Disk - \$79.95

Named descriptively, The COMPLETE PERSONAL ACCOUNTANT is not just a double entry bookkeeping program, but a group of ten related programs, plus a menu program, that are loaded as needed.

The 10 Programs are:

CHART OF ACCOUNTS
CHECKBOOK MAINTENANCE
CHECKBOOK SEARCH
DETAIL BUDGET ANALYSIS
SUMMARY BUDGET ANALYSIS
NET WORTH/INCOME EXPENSE
PAYMENTS CALENDAR
APPOINTMENTS CALENDAR
MAILING LIST
COLOR GRAPH

Although one could set it up for a small business, the system seems to be designed primarily for home use. I say seems because you have to look at the design in order to know. The Standard Chart of Accounts lists home type accounts, but I saw nothing that mentioned specific uses. When I requested a tape, in addition to a

disk, for this review, I also received some ad copy which does mention Small Businesses as possible users.

In all fairness I must say that the home which can use this program to capacity is elaborate indeed. The standard chart of accounts has 66 accounts, to which you may add up to 33 more. (You may also delete or change any of the accounts.)

Because the documentation deals with both tape and disk, I first thought that both were included; but, as with many others, you have to choose between them. This may not be too bad, however, as the programs are apparently the same, so the Tape version can be saved to Disk (but you would need to change the File references). Over all, COMPLETE PERSONAL ACCOUNTANT does seem aimed more toward Disk Users.

DOCUMENTATION

The standard sized three ring notebook containing the documentation is nice, but not exceptional. It would be better if the rings were a little larger. For 150 pages, a three quarter inch ring is a little small and binds the pages.

My first impression, as I browsed through the extensive documentation, was that it seemed very thorough and well organized. The first dozen pages of "get acquainted" material included: Table of contents, Introduction, Outline of Features, Equipment Comments, and Getting Started. The Getting Started section contains sections on First Time Loading, Media Handling, First Time Processing, Routine Processing, and Error Procedures.

After this opening section, each of

the ten programs that make up the system is treated individually. Each section begins with a map of the Options and Operations. Then comes descriptions of the Options and Operations Menus, Program Loading, Data File Loading, Processing and Saving and, finally, Printing to the Screen or Printer (which, by the way is quickly and easily done at almost any time).

In the appendix are about a page and a half of file descriptions (which are duplicated in several sections) and two and a half pages of tips on Double-Entry Bookkeeping. Sample printouts are included where appropriate. Each program gets an average of eleven pages of instructions. The last section of the Manual is a 6 page Index.

THE PROGRAMS

If nothing else, the COMPLETE PERSONAL ACCOUNTANT is colorful. I have never seen so many CLS(n)'s, etc. Every section has its own opening rainbow, also. A typical working screen is the Checkbook Maintenance screen, which will probably be the one used most. The screen makes use of a "fill in the blanks" format. You fill out a black check positioned on a yellow background, which is surrounded by black bars. The check has green blanks under inverse headings. At the bottom of the screen is a sub-menu in inverse lettering. At the top of the (yellow) screen is a sub-sub-menu on a green bar, with standard black on green lettering.

The COMPLETE PERSONAL ACCOUNTANT is full of bells and whistles (lots of nice 'extras'). This may mean that you have

CoCo POWER

UNLEASH THE POWER IN YOUR CoCo
WITH ONE (OR MORE) OF OUR BOARDS.

WORD-PAK \$139.95

The WORD-PAK is a video board designed to plug into the expansion port of the Color Computer. The board produces an 80 column video display that compares easily with the high priced terminals. Software, included with the board, provides such terminal functions as: erase to end of line, erase to end of screen, home cursor, x-y cursor positioning, etc. and the ability to re-program the display for different screen formats. This last feature is useful in that it allows software, written for other computers (such as the Model I), to be run on the Color Computer. Additional software support includes a Flex patch, which allows the user to run ALL standard Flex software, and an enhanced version of TEXPRO III (text editor/processor).

MEM-PAK \$110.00

16K RAM/ROM expansion board. Expand RAM beyond 64K (using the C-C BUS) or put your programs/utilities in ROM for instant loading. The board utilizes 24 pin, compatible memory devices. (Supplied with 16K RAM).

P-C PAK \$ 79.00

Free up your serial port for communication by adding this fully buffered, Centronics compatible, parallel printer port to your computer. The cartridge can be supplied with an optional real time clock for \$122.95.

C-C BUS \$149.95

The C-C BUS is an expansion bus which connects to the expansion port of the Color Computer and provides the user with six, software selectable, expansion ports. The bus is completely compatible with any size system and automatically senses system size to prevent contention problems. A unique feature of the C-C BUS is the ability to expand system memory size beyond 64K by adding one (or more) MEM-PAKs to the bus. A typical system might contain a disk controller, a parallel printer cartridge, a 16K RAM board, and a WORD-PAK, all installed and available to the computer.

PROTO-CoCo \$ 10.95 (3/\$20)

Build your own expansion projects on this prototyping board that will mount inside a disk controller case when you're finished. Included is a manual with several expansion ideas.

BARE BOARDS

Save money by building your own. We will supply complete documentation including schematics, layout and parts list.

WORD-PAK BB	\$17.95
C-C BUS BB	\$22.95
P-C PAK BB	\$17.95
MEM-PAK BB	\$14.95

SPECIAL:

To celebrate Color Micro Journal's premier issue, we are offering the C-C BUS and the WORK-PAK at special prices. If you order before September 30, 1983 and you mention that you saw the ad in Color Micro Journal, you can purchase the C-C BUS for only \$129.95. Or you can purchase the WORK-PAK for only \$99.95 if you order it with the C-C BUS at the regular price.

MAIL ORDERS

Send check, money order, MASTER-CARD/VISA (include card number, inter-bank number, expiration date and signature) for total purchase price, plus \$2.50 for shipping and handling (Canadian orders please add \$5.00). New Jersey residents add applicable sales tax.

PJ inc.
P.O. BOX 813
N. Bergen, N.J. 07047
(201) 330-1898

Build performance into your system

with OS-9™ software tools

Unix®-based, multitasking, modular, and versatile: these key features are some of the reasons why more 6809 computer manufacturers have selected OS-9 as their standard operating system than any other. And OS-9 has been put to work by thousands of users in almost every conceivable computer application in business, science, industry, education, and government.

Your operating system should not be a barrier between you and your computer. OS-9 is very friendly and easy to use. Its modular structure makes it easy to customize, plus its comprehensive documentation shows you exactly how to interface it to just about any I/O device.

OS-9's advanced features unleash the performance potential of almost any 6809 computer — large or small. In many respects the OS-9/6809 combination is more powerful than many minicomputers!

There are two basic versions of OS-9. Both have the same basic features and capabilities. OS-9 Level One runs on small to medium sized systems having up to 64K memory. The Level Two version runs on medium to large size systems having memory management hardware and up to 1 megabyte of memory, and includes record and file locking for multiuser database applications.

Here are just a few reasons why you should insist on OS-9 for your microcomputer system.

- Over 40 utility commands
- Friendly "Shell" command interpreter
- Tree-structured multilevel file directories

Full timesharing support with log-in and file security
Fast, secure random and sequential access files
Comprehensive English language error messages
Compact real-time multitasking executive
Hardware or software memory management
Device independent interrupt-driven I/O
Fully ROMable for small control systems
Standard versions available from manufacturers of most popular 6809 computers

OS-9 PASCAL Language Compiler

most complete and versatile PASCAL available for the 6809 capable of generating P-code for interpretive execution while debugging OR highly optimized 6809 assembly language source code output for maximum speed
"Virtual memory" P-code interpreter lets you run large PASCAL programs

CIS COBOL ***Compiler

Ideal for most demanding business applications features ISAM, Debug, ACCEPT/ DISPLAY and Interprogram Communications modules retains full compatibility with CP/M software meets ANSI 1974 Level One COBOL standard and is GSA certified Also available—FORMS 2 automatic program generator for easy interactive design of screen oriented applications

BASIC09™ Structured Basic Interactive Compiler

fastest and most comprehensive full Basic language available for the 6809 combines standard Basic with the best features of PASCAL features compiler speed, interpreter friendliness and superlative debugging facilities option available: Run BASIC ROMable run-time system for compiled BASIC09

C Language Compiler

complete implementation of the UNIX version 7 C language includes INT, CHAR, SIGNED, UNSIGNED, FLOAT AND LONG data types, structures, unions, standard C library and a preprocessor with macro definitions generates fully relocatable assembly language source code output

For more information contact your computer supplier or



MICROWARE

Microware Systems Corporation
5835 Grand Avenue
Iowa 50312 515-274-9100
910-520-2635

*Unix is a trademark of Bell Laboratories. ***CIS Cobol is a trademark of Micro-Focus, Inc. OS-9™ and ROMable are trademarks of Microware Systems Corporation. Motorola, Inc.

some studying to do before you will be able to use the Program to its capacity (that may go for your own Books, as well), but it also provides a lot of capability.

The first thing you will need to do, if you don't want to use the rather massive Standard Chart of Accounts, is make up your own. In this case, you must KNOW your own Books (or Bookkeeping System), and it is easy to leave out things.

To begin using the **COMPLETE PERSONAL ACCOUNTANT**, you load the Menu Program, which then loads your choice of the ten remaining Programs for use. At the end of each program, when using Disk, the menu program is automatically loaded from the disk so you can make your next selection. With the Tape Program, each Program is ended, and you must **CLOAD** the Menu if you want it again. You can also **LOAD** or **CLOAD** individual programs directly, which is almost a necessity with Tape due to the LONG times involved in searching through the tape for a File when automatic loading.

CAPACITY

All of this activity calls for some 77K of Program space. Of course, this means that only a portion can be in use at any one time, and is the reason the **COMPLETE PERSONAL ACCOUNTANT** is broken down into 10 different Programs (which is a normal procedure, even on the larger Computer Systems, for BASIC Accounting Programs). The Programs use Sequential Files, which eliminates the interactive possibilities of Direct or Random Access with Disk Systems (but is required for Tape Storage), but also provides for more efficient use of Mass Storage Space and faster operation of each function, since the Data must be in memory. It also means that the Programs must be as short as possible, to leave as much room as possible for the Data. When a "work session" is completed for each program selection, the Data for the whole period is saved as a single complete File.

The Checks Program I received left space for 250 entries in a 32K Computer. A 16K Computer would allow 50 entries, and that number is available only with the Tape version (since the Disk Operating System takes up a good bit of RAM itself). You would need to use shorter periods if this was not enough Checks for a month (for example, use one or two week periods, if needed).

CHART OF ACCOUNTS

The step-by-step nature of the Manual makes it fairly easy to get started using the **COMPLETE PERSONAL ACCOUNTANT**. Instructions clearly explain how to alter the Standard Chart of Accounts for your own use. Account numbers are used, which also helps in the subsequent organization of your Statements.

Once this system is set up, it is saved on the Program Disk (make sure you are using a **BACKUP** of the Master Disk) for Viewing or Changing, as the case may be. Viewing is done by choosing a Print Statement from the menu. It is not absolutely necessary that you have a printer to use this program, because most of the Print Operations give you the option of

printing to the Printer or to the Screen.

CHECKBOOK MAINTENANCE

This is the usually heart of your Bookkeeping System. One option sets up a file for any new period, be it a year, a month, or a week; your choice. After that you will load this (or any other) file and make additions or changes - or simply browse - as needed. When changes and additions are finished, the updated File is saved again.

The actual entry process goes something like this. From the bottom of the screen, below the above mentioned black check, you choose one of seven options: ADD, CHANGE, DELETE, MENU, NEXT, LAST, SEARCH. This is done with a single keystroke. Assuming you chose ADD, another menu immediately appears above the black check, offering: CHECK or DEPOSIT. Again, only a single keystroke is required. The cursor moves to blank number one. You enter a check or deposit number and **<ENTER>**. Next, at blank number two you enter an account number - **<ENTER>**. A sub-account number follows, then a six stroke Date MUST be entered; you can't go on without it. You can use up to 15 characters for a Name or Description (no commas please). Enter any amount under a Million Dollars, and then you are presented with another choice; Tax Deductable or not? If it is, a flag is set.

At this point, two other things happen before you go to the next entry. First, you will see a new balance at the bottom, which is updated with each entry - handy if you're running close. Then, you make a basically identical entry for the opposite account. Debits and credits, remember?

If you made an error during your entry, you would choose CHANGE to make corrections. Also, you may move backward and forward to make changes. This is the ONLY way you can correct errors; no aborts may be done during entry. Once a check is started, ALL the blanks must be filled, and THEN a change can be made (other than using a backspace before entering the data for that line).

DELETE, of course allows you to eliminate any check entry. NEXT and LAST (you always press the first letter of an option) move you forward or backward through the list. With SEARCH you can go directly to any check or deposit number. And, when you are satisfied and the Check entries are finished, MENU takes you back to the Main Program Menu.

With this section of the program you have an effective checkbook balancing routine which marks each check off as you go through your Bank Statement. There are little features that figure service charges, interest or dividend payments, etc., to keep that balance fine tuned.

You can Write Checks either through the Program or on your Printer. Special markers are placed on corresponding entries, and you can even dump your whole checkbook to printer.

There are two kinds of saves on the Checks Menu. A Regular File save MUST be done after each session, but there is also a Checks Summary save which is used by other programs at period endings, etc.

CHECKBOOK SEARCH

This program has much broader Search power than that in the Checkbook Maintenance Program. Assuming you have all of a years entries on one disk, you can quickly call any period in the whole year for Search. You may just browse through the files, or you may search by check number, deposit number, account number, date, or description. NO Changes may be made with this program; that must be done in Checkbook Maintenance.

DETAILED BUDGET ANALYSIS

This is one time when you will

COLOR MICRO JOURNAL

SEND ALL CORRESPONDENCE TO:

Computer Publishing Center
COLOR MICRO JOURNAL
5900 Cassandra Smith Rd.
P.O. Box 344
Hixson, TN 37343
(615) 842-4600

Entire contents Copyrighted by
Computer Publishing Inc. (CPI) 1983

Editorial Staff

Don Williams Sr.	Publisher
Robert L. (Bob) Nay	Editor
Thomas E. Williams	Production Editor
Larry E. Williams	Advertising Editor

Administrative Staff

Mary Robertson	Office Manager
Joyce Williams	Accounting
Carolyn Williams	Accounting
Penny Williams	Subscriptions
Deborah K. Pike	File Management

Items Submitted for Publication

COLOR MICRO JOURNAL is actively soliciting contributions for publication. We are looking for ANY type of material that will be useful to a Color Computer Owner; from hints to full Programs and Construction Articles. We will pay for submissions based on a number of criteria. If you wish payment for a contribution, be sure to state these requirements with your submission. ALL submissions must contain a statement that the material is not currently under consideration by another publication. For more detailed information, send a SASE to the Editor, **COLOR MICRO JOURNAL**, P.O. Box 344, Hixson, TN 37343.

Articles submitted for publication should be accompanied by the authors Full Name, Address, Date, and Telephone Number. It is preferred that articles be submitted as a **.TXT** File on a **FLEX** Formatted 5 or 8 Inch Disk, or as an **ASCII** File on a Radio Shack Disk or Tape (a **YDAT** File). BASIC Programs should be submitted on Disk or Tape in the normal Binary Format.

If articles are submitted on paper, they should be either Typed or Printed Single Spaced with a MAXIMUM Line Length of 40 on normal 8 1/2" x 11" bond or better paper. A good BLACK Ribbon must be used because all paper submitted articles will be photo reproduced. NO hand written articles will be accepted (except required art work which goes with an article). Again, PLEASE use a DARK Ribbon.

All letters to the editor should also comply with the above and MUST bear a signature. Letters of 'gripes' as well as 'praise' are solicited. We attempt to publish all letters to the editor verbatim; however, we reserve the right to reject any submission for lack of 'good taste'. We also reserve the right to define what constitutes 'good taste'.

Advertising: Commercial advertisers please contact the **COLOR MICRO JOURNAL** advertising department for current Rate Sheet and Requirements.

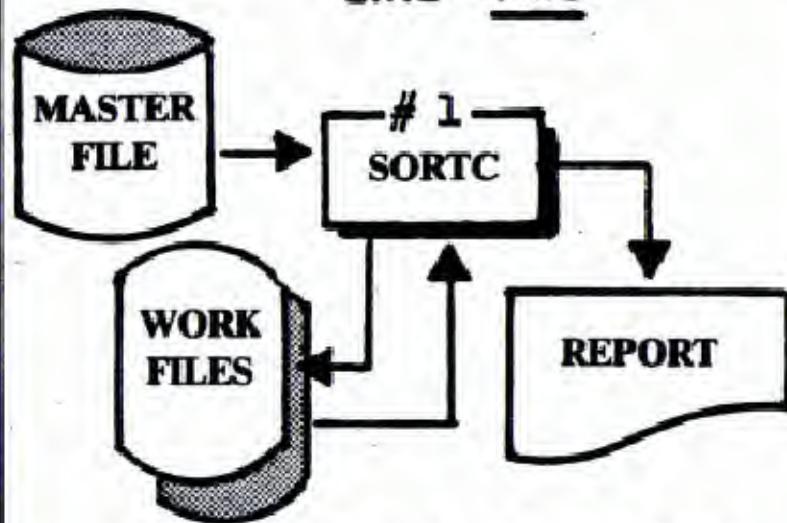
TRS-80C, Color Basic, Extended Color Basic, and Disk Color Basic are trademarks of the Tandy Corp. FLEX and UNIFLEX are trademarks of Technical Systems Consultants, Inc. OS-9 and BASIC09 are trademarks of Microware Systems Corp. UNIX is a trademark of Bell Laboratories.

Color Micro Journal

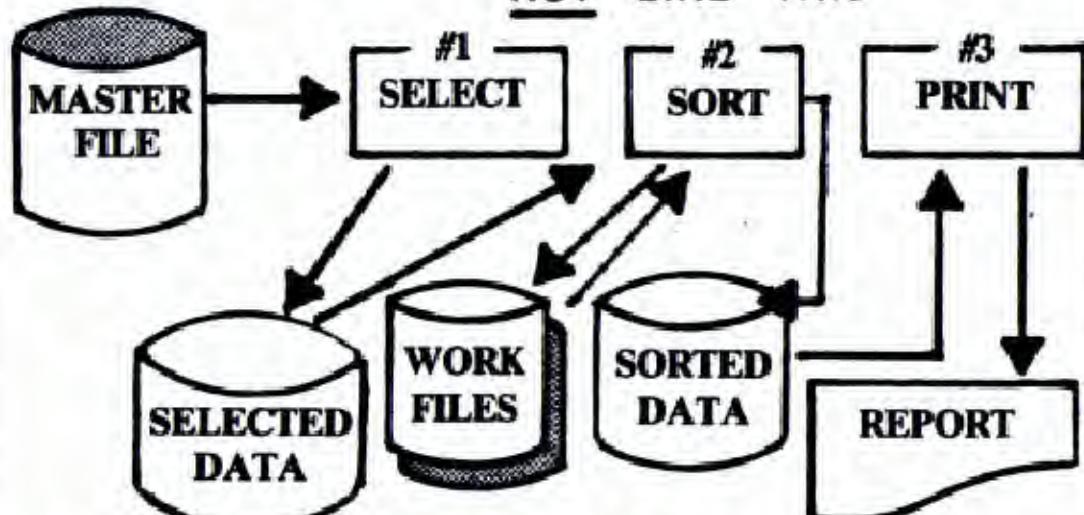
SORTC** for OS9*

THE ONE AND ONLY

LIKE THIS:



NOT LIKE THIS



BOLDLY GOING WHERE NO SORT HAS GONE BEFORE

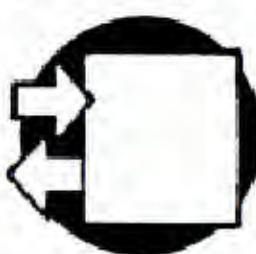
SORTC is a high speed, full-record compounding disk sort, which gives microcomputer users mainframe capabilities. It has been specifically designed to sort data efficiently while offering the user great flexibility in designing sort programs. It is written in **BASIC09*** for use under OS9.

COMPOUNDING FUNCTION

SORTC has the capability of summing user-specified numeric fields on equality of keys. This allows significant savings in memory, disk space, and program development time. A reduction in the number of disk accesses required when compared to other sorts is inherent in the design of **SORTC**.

DISK BASED

Specifically designed to sort large volumes of data, **SORTC** imposes no size restrictions on the amount of data to be sorted. It also places no limits on the number of sort keys which can be used or the order in which the keys are sorted. Furthermore, the sort procedure can be performed as many times as necessary within the same program. This feature allows the programmer to take advantage of any existing data bias, and possibly even reduce the size of the sort key.



JBM'S MIDWARE

*OS9, BASIC09 are registered trademarks of Microware Corporation.

**Uses the same algorithm as JBM's SORTC for Digital Equipment Corp. RSTS Systems.

ADVANCED DESIGN

While most disk sorts are partially based upon the Fibonacci series, **SORTC** is not. **SORTC** is a generation ahead of the normal sorts based upon the "Fib series". Its unique algorithm is automatically optimized at run time for a reduction in workspace, reduced # of disk accesses and shorter run times. Designed to be as "crash proof" as possible, the sort procedure will not abort if it is accidentally asked to sort zero items.

EASY TO USE

It is not difficult to design a program which will use JBM's **SORTC**. Since **SORTC** is a subroutine, the user may write any procedure he or she wants to format the data for sorting and then to process the sorted data. The sorted data need not be written back to disk, but instead is immediately available. The sort code is automatically inserted into the source procedure by a simple Sort Generator.

ORDERING INFORMATION

SORTC, from JBM's **MIDWARE** line of quality software, is available on either five and one-quarter or eight inch diskettes for a price of \$150.00. All of JBM's software packages come complete with comprehensive user's manuals.

For more information, or to place an order, contact:

DEPT. FSEA
The JBM Group, Inc.
332 West Church Road
King of Prussia, PA 19406
TEL: 215-337-3138
TWX: 510-660-3999



VISA and MASTERCHARGE accepted.

surely want a printer. Everything you have done is gone over with a fine-toothed comb. Your Chart of Accounts is loaded to keep everything in place. Your most recent Budget Analysis is loaded, as are your Check Files. Dates, Amounts, and Account Numbers fly thick and fast. You may make additions, changes, searches, and deletions. Finally, a neat, detailed, and well organized analysis is printed to Screen or Printer.

SUMMARY BUDGET ANALYSIS

This is similar to the previous report, but has more of an outline form which looks much like a corporate report. Information comes from Check Summary and Detail Budget Analysis Files.

NET WORTH/INCOME EXPENSE

Information for this statement comes from Summary Files, prior Balances, prior Income Statements, and your Chart of Accounts. In addition to this, you have the opportunity to enter records not involving checking accounts, such as cash expenditures and various receipts not normally routed through checking account deposits. As always, step by step instructions guide you through the process.

CALENDARS

Although not as fast as machine language programs, the Payments Due dates and Appointments can be real conveniences. The computer can remind you who you need to pay or visit, where to go, and when, what job or report must be completed, and so on. The possibilities are almost endless. Lists or Calendar Pages with overall views may be had with the push of a few buttons. You may choose a day or a month from years ahead, assuming that you are that well organized.

MAILING LIST

This, of course, includes an Address List; or rather, Lists. Since your List has a name, and is loaded by name, you can easily have lists for anything you can find a name for. One small but appreciated feature is the two lines available for the address. Both box number and street number can be put on file easily. And when mailing time comes both lines, if used, will be printed.

For simple address finding, it is handy to be able to search for any bit of an Address or Name you can remember. For example, SPR located an address in Spring City, AT located ATKEISON etc. You could even look for AVE or BOB or 15th. You could find Smith by using "th".

When it comes to mailing time you can sort by ZIP, Name (first letter on the line), Address, State, or an Account Number which is available for each address entry; but be prepared to mail to one or all. On the other hand, I suppose separate sub-lists could be made for lists not in either of these extremes.

COLOR GRAPH

If you are visually oriented you will find this one helpful. You can compare

just about any amount for any period you specify, with a total for each type of record selected. Expense, Income, Assets, Liabilities, Check Summaries, and Budget figures can all be compared.

IN PASSING

You will probably have a hard time finding more Program for the money than you get in the **COMPLETE PERSONAL ACCOUNTANT**. There are a lot of twists and turns available; some of the features you may never use, but its nice to have them when needed.

Some of the things go a little slow and might not be best for someone with a heavy data flow; but this Program is not aimed at the BIG users, either. On the other hand, if you have a lot of different kinds of things to keep track of, this could be the System for you. I think of a friend who is a Doctors wife and is into everything, everywhere. She is a capable manager and understands bookkeeping, and could use most of the features of this Program. If you don't get along very well with such things, you may be better off finding a less involved program, as this one requires keeping up with.

Business books were mentioned earlier. How useful it might be would depend on a number of things. My business requires quick and easy retrieval of job oriented information. Few affordable programs can give you that in addition to regular bookkeeping. If your business requires pretty standard bookkeeping at regular intervals, the **COMPLETE PERSONAL ACCOUNTANT** might be just what you need.

This is one of the few Accounting Programs to attempt to use some of the Color Computer's color capabilities. My wife is a mainframe operator, and her first reaction to the heavy use of color on the screen was somewhat negative. I think the main problem is the lack of pastel colors in the CGO; I found it to be more comfortable after I had turned the Color Level down quite a bit.

There will always be minor complaints; any Program is a matter of trade-offs. In its multi-use nature, the Program Disk must be inserted frequently. There should be prompts for this. Mid-entry abort methods for clutz's like me would be nice. And, I'd like to see it tell you to put a disk in the drive with less than four or five different confusing ways of saying it. You would probably find your own peeves. Oh, what I wouldn't give for the **PERFECT** Program!

A WORD ON TAPE

The **COMPLETE PERSONAL ACCOUNTANT** works surprising well on tape, all things considered. I did have trouble getting backups of my cassette, perhaps because my system requires a mite more volume than most. But, functionally, it is quite workable once you do that.

If you were to put heavily used programs on short tapes by themselves, you would have a bit of cassette swapping to do, but it would save some long runs to the end of the cassette. And, it would beat spending cash for disk when cash is in short supply.

IN CLOSING

Most of you know this Program as **THE COLOR ACCOUNTANT**. As this review was being finalized for delivery, I learned that the system has been renamed to **COMPLETE PERSONAL ACCOUNTANT** due to the fact that it has been adapted to a number of other computers on the home market. Since that is the name that you will be seeing from now on, I went back and updated the programs name throughout this review.

Jim Lalone

OS-9 TIPS

Continued from page 1

ences with the disk controller that the step rate was set with the two low order bits in the control register along with a disk controller command. The control register is at \$FF48. I started searching for code that stored into this address. Using debug and its "S" command, I found CCDDISK had multiple references to the control register address.

Working backwards and looking for A or B register loads which would later be stored into \$FF48, I soon found a step command with the low order bits turned on, hex 13. This would step the head at a 30ms rate. I changed this byte to \$10 using debug and exited debug. Imagine my elation when I issued a DCHECK command and heard the drive sound like a real 6ms stepping disk drive. If you have any experience with FAST drives, you know what I am trying to say.

Here is a screen image of the Debug session to change the disk drive step rate to 6ms. Do not do this unless ALL your drives are 6ms drives. The change is in common code which is used on all drives.

OS9: DEBUG Interactive Debugger

```
DB: L CCDDISK  $ link module
DB: B000 87  $ dot address change
DB: . .+1FE  BEFE 13
DB: =10  $ change $13 to $10
DB: BEFF 80  $ check changed byte
DB: -  BEFE 10  $ looks okay
DB: 0  $ exit debug
```

If you don't see the bytes as shown above, you might have a different version of the operating system. My system master disk is marked version 01.00.00. The addresses might very well be different since the CCDDISK module may be loaded on a different page in your system. The data should be the same or the change will probably be invalid for your version of the operating system.

I didn't want to do this every time I booted OS9, so I saved the OS9Boot file to disk, updated the CRC and copied it back to my system disk. I won't go into detail on this, since the section on patching OS9 component modules in the debug section of the Program Development manual tells how to do this.

Some other tidbits:

The DCHECK command has an undocumented option, -D, which shows the set bits in the allocation table.

In addition, the DUMP command has TWO undocumented options which are used when you want printer output. The first is -L, which gives a long line, 16 bytes per line instead of the usual 8 bytes on screen output. You can use this when outputting to the screen but it doesn't look very good. The other option is -H, which gives a printout without the header. This is useful for screen output since more bytes are shown on the screen at a time.

The FORMAT command has a couple of additional options. You may include the volume name when you call the format function. This precludes the wait for entry of volume name before verification begins. Make sure you place double quotes around the volume name. Otherwise

a 40D will be included in the volume name. The other option, R, will eliminate the prompt for disk insertion. This assumes the disk is in the target drive and ready for formatting. Be careful with this option, unlike R/S disks, the directory for OS9 starts on track zero and will quickly be written over if you make a mistake.

Now for the EDIT macros. The editor at first glance, seems to be not much better than the extended basic editor you have been using. However, the macro facility makes the editor quite powerful. Here are several macros I came up with during my first session with the editor.

TOP is a simple sequence to show the first screenful of lines at the beginning of the file.

```
TOP
VO -P L12
!end of macro
```

SPLT is used to break a line into two pieces. The value of N is the number of words to keep on the first line.

```
SPLT #N
! split line at the Nth blank
VO
C .SEARCH# / 1 #N
!// C2 K1 -L
!end of macro
```

JOIN will join the current line to the one just before it.

```
JOIN
! join current line to prior line
VO <1 K1 -0 L
!end of macro
```

One more item. To go to back to R/S DOS, press reset and when you see the OS9 BOOT message, press reset again and you will be back in Extended Disk Basic.

Hope you enjoy exploring and using OS9 as much as I have.

Jack L. Aker

don't think ANY Show Sponsor has been happy with the attendance since the first one in Chicago last Fall; I KNOW that VERY FEW of the Exhibitors have been happy with them. I am NOT throwing rocks at any Show Sponsor; I would like to know what YOU, as a Color Computer User, think! Did YOU attend any of the Shows? If so, what did you like and dislike; why did you go; etc.? If you did NOT go to one, WHY not? What would you LIKE to see at a Show? How far would you be willing to travel to go to a Show? In general, what are YOUR thoughts on the subject?

From an EXHIBITORS point of view, we were not very happy with the turn outs at the ones WE attended, and we talked to VERY FEW exhibitors that WERE happy. Most exhibitors are willing to attend a Color Computer Show IF they can BREAK EVEN; very few can afford to LOSE MONEY when attempting to let YOU see their Product FIRST HAND. I know of a couple of planned Color Computer Shows that have already been cancelled because of the history of the last several Shows, and I know of SEVERAL exhibitors who will NOT be attending future Shows (even to the point of forfeiting their deposits, since they will lose less money that way than if they attend the Show). Our personal impression was that Exhibitors with HARDWARE for Sale may have come out OK, but the SOFTWARE suppliers lost a lot of money (you have to sell a LOT of \$40.00 Programs to offset several thousand dollars Show Expense).

We at Computer Publishing have NO intention of sponsoring a Show, so maybe WE can act as a "unbiased information collector". We would like to hear from YOU, both Color Computer

OWNERS and EXHIBITORS. We will collect the information, and provide it to ANYONE who wants it (with Names withheld if so requested). Let us hear from you!

"Let the Buyer Beware"
or
"If the Shoe Fits, Wear It"

I am constantly concerned with the "Mass Marketing" techniques used by Advertisers in the United States, and what it IS doing and HAS done to the Personal Computer Industry over the years. I am also very sorry to KNOW that the same procedures are used within the Color Computer community. We constantly hear from Users who purchased a "Board" that was advertised to work with 16, 32, or 64K Systems, who found out AFTER spending their hard earned money that, first, a Multi-Pak was required (NOT mentioned in the Ad or by the Seller), and, second, that although it would work with any of the Memory Configurations, that was irrelevant, because it only USES 16K (which, in this particular case, severely restricts its capability). Or, from someone who purchased a "Super Fast, Better than Arcade" Game, and then found that it used Low Resolution Graphics for the speed, and only had about 10% of the Arcade Versions capability. Or; etc.

BUT, the Advertiser says (in an example like the Board Purchase), "We would have told him if he had asked." HOW is a purchaser to KNOW WHAT QUESTIONS TO ASK? This is the FIRST Computer that MOST Color Computer Owners have been exposed to; they don't have the Knowledge, Experience,

THIS 'N THAT

Continued from page 1

a Program provided by one of those System Manufacturers, I must go BACK to the "DEFS" Files that were available AT THAT TIME, because the names of the files are different with later Versions of the Operating System. The other option is to list BOTH the OLD and NEW "DEFS" Files, search through the Assembly Listing to see what Calls, etc., are needed, and see if they are included in the NEW one. Obviously, this can be a real project. A second problem is that I have to request over 20K of Memory just to assemble a Device Descriptor (which usually results in about 50 Bytes of Code), because there are now some 750 EQUs, SETs, etc., which have to be loaded to be sure the half dozen needed are there. Hopefully, I "can't see the Trees for the Forest", and someone will come up with a simple solution to this problem, but I'm not holding my breath.

If you are in the least bit interested in OS-9, drop a note to the

OS-9 Users Group

P.O. Box 8027

Des Moines, Iowa 50301

for full information. They, and ALL Users, can use YOUR support, help, ideas, questions, programs, etc. That's what a Users Group is FOR!

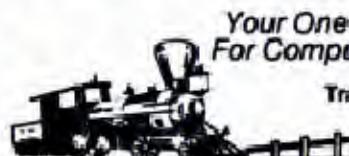
Color Computer Shows

The next subject I would like to discuss this month is the different Color Computer Shows that have been held around the country this year. I

Chattanooga Choo Choo Software

Your One Stop Station
For Computer Programs

Track 29



Datasoft, Inc.
Zaxxon (32K) \$39.95 Tape or Disk
Moon Shuttle \$29.95 Tape or Disk

Spectral Associates
Ghost Gobbler
\$19.95
Planet Invasion
Space Race
Gallax Altax
\$21.95 ea.

Railroad Salvage Sale
Guaranteed to load
Some Demo Software
Save up to 45%
3 Cave Hunter \$16.95
1 Cave Hunter Disk \$16.95
1 Nova Pinball \$14.95
1 Pacdroids \$14.95
2 Katerpillar Attack \$16.95
5 Astroblast \$16.95
2 Astroblast Disk \$19.95
6 Railrunner \$16.95
1 Trilogy 3 Games \$29.95
(Invaders, Ghost Gobbler, Space
War)
2 Intergalactic Force \$16.95

Prickly-Pear Software 15% OFF
Shaft \$24.95 \$21.20
*Vikings, Flight (32K), Jungle
\$19.95 \$16.95 ea.

Antech Software
Intergalactic Force \$24.95
Pinball \$24.95
(Available in Rom Pac)
\$29.95 ea.
(Available in Rom Pac Only)
8 Ball \$29.95
Whirly Bird Run \$27.95 ea.
Ghost Gobbler \$27.95 ea.

Kraft Joystick
"The Best"
1 Year Warranty
\$49.95 ea.

Early Games
Preschool learning
\$28.95 Tape or Disk

Buy 1 Program Get 10% Off
Buy 2 or more Programs Get 15% Off
Except Prickly-Pear Software

Adventure International
Sea Dragon (32K)
\$34.95
NEW! Fire Copter
\$24.95

Tom Mix Software
*Donkey King (32K)
\$26.95
Space Shuttle (32K)
\$28.95
NEW! Trap Fall, Frog
\$27.95 ea.

Computerware
Doodle Bug
Shark Treasure
\$24.95 ea.
Rail Runner
\$21.95

Mark Data Products
Super Pro Keyboard
\$69.95
Glaxxons, Bumpers,
El Bandito & Cosmic Clones
\$24.95 ea.

"Also available on disk (32K) at extra charge.
All programs 16K on cassette unless otherwise stated.
Send for free complete catalog and descriptions!
WE pay postage, YOU save money! (in the U.S. and Canada).
TN residents add 6.25% sales tax, C.O.D. orders add \$2.00



(615) 875-8656 • P.O. Box 15892 • Chattanooga, TN 37415



and "Computer Sophistication" to be able to "read between the lines" in the Advertisements, or to be aware of the "pitfalls" awaiting them in the Computer Industry. Happily, **MOST** Advertisers and Producers in the Color Computer Industry are aware of the situation, and are **RESPONSIBLE** Organizations that support their products **100%**, and make **EVERY ATTEMPT** to present their products **HONESTLY** in all of their Advertising. It is the **1%** that causes all of the problems. Another factor that must also be mentioned is that the problem may **NOT** be the **PRODUCERS**, but one of their "agents" (Dealer, etc.).

More relevant, how do **YOU** find out what is **GOOD** and what is "not so good"? By reading Advertisements? **THEY** tell you **WHAT** is available; from **WHERE** I have been "burned" so many times that if I see a big ad with an eye-catchingly dressed women, for example, I wonder what the Advertiser is covering up! The Advertisers problem is: "How do I catch the Readers ATTENTION when he is leafing through over a hundred pages of Advertisements in a Magazine?".

You have about four options: 1. Buy the product and learn the hard way; 2. See the product in use by someone else; 3. Buy **ONLY** from those suppliers and **ADVERTISERS** that you have learned

you can **DEPEND** on (usually by method 1. above); or, 4. Depend on Product Reviews published in available Magazines.

Oh yes, there is **ANOTHER** option; **STEAL** a copy of the Program by copying it from a friend. If it is not any good, you are not out anything, so you can throw it away. Only; I'll bet that your **FRIEND** will tell you that it is **NOT** any good, and so you **WON'T** copy it. **BUT**, if he tells you that it **IS** good, do you go out and **BUY** it, so that the producer of that **GOOD** Program will be encouraged to write **SOME MORE** **GOOD SOFTWARE**? How would **YOU** feel if you had been paid **10%** of your normally expected salary for the work that **YOU** did the last **6 to 18** months? That is about how long it takes to write a **DECENT** Program. Think about it!

Option 1 costs a lot of money. Option 2 is the most dependable, but it is usually hard to find a friend with almost any product that you might be interested in. Option 3 should be followed in **ANY** case, no matter **HOW** you learned about a product. Which brings us to Option 4; **REVIEWS**.

Reviews can be a real **BOON** to a Computer User; they can also be the cause of much consternation! **VALID** Reviews are worth more to an Advertiser with a **GOOD** Product than **ANY** amount of Advertising. Conversely,

a **BAD** review can be a **Death Sentence**. Again, **YOU** will probably have to learn "the hard way" which Magazines and Reviewers you can depend on. You are skeptical of Reviews because you feel that the Magazine is not going to "downgrade" one of their Advertisers Products with a "bad" Review, taking a chance on losing that income. In some cases, you may be right; I don't know. There are other problems involved, from a publishing standpoint.

Finding **GOOD** Reviewers is a problem; someone who is familiar with that type of product, and who can write about it so that you can learn from it. Obviously, if you know **NOTHING** about accounting, you could not write a decent review of an Accounting Program. Often, WE don't get adequate information with the Product from the producer; what type of User is the Product targeted towards, what Computer Configuration is required, etc. We sometimes receive products for review that do not even have pricing information available. The **ADVERTISER** has a lot to do with the quality of the Review of his product. As an additional note, **SOME** Advertisers are extremely "choosy" about where they send Products for Review, **ESPECIALLY** if they have something to hide. Enough said!

I can only state **Color Micro Journal's** position towards Reviews, and let you make your own judgments. The two primary concerns are 1, "What would **YOU** want to know if **YOU** were interested in that Product?", and 2, "Does the Product do what the **ADVERTISEMENTS** say it does?". That is, the Review should fill in the information "between the lines" of the Advertisements, and provide the details of Operation, Strong Points, and the Limitations that the Advertiser can not afford to discuss in an Ad (or those that they would rather sort of "skip over"). The old "Tell it like it **IS**" routine! We also like to include some examples of the use of the Product, where possible. This helps **YOU**, the Reader, learn more about the potential of that Product, and also helps you get a better feel for what is involved in its operation. An example of this type of Review is the one on the **EliteCalc** Program which we ran in the Sept. '83 Issue of **CMJ**.

First, if the Product is "good", there is no real problem except that of finding someone with the experience, Computer configuration, and writing ability to provide a timely review.

If the Product does not work, or the Advertising is mis-leading, then the problems begin. The **PRIMARY** concern of **THIS** publication is the advancement of the Color Computer and its Support Products. The best way to accomplish this is to help you learn how to make greater **USE** of your Computer, and to help you around the "pitfalls" like poor products. **BUT**, we have seen, in six years experience with '68' **Micro Journal**, some **VERY GOOD** products become available that started out as **JUNK**! The major factor that produced a good product was that the **PRODUCER** was sincerely interested in providing a **GOOD** product, and took our reviewers comments as "constructive criticism" and worked from there. Our procedure for a bad review is to get in touch with the producer, and see what happens. Sometimes it turns out that it was a "bad review" of a decent

SPECIAL OFFERS From Star-Kits

Christmas Sale (Until December 24, 1983)

STAR-DOS 64

Reduced from \$74.90 to \$49.90 (\$52.90 for the AMDEK 3" disk.) Get the 64K and 16K/32K versions for the price of the 16K/32K versions alone. Here is your chance to get this extraordinary Disk Operating System for the Color Computer at a great price.

SPELL 'N FIX

Reduced from \$69.29 to \$59.29 for the CoCo disk or cassette version, and from \$178.58 to \$125 for the Flex disk version. (Add \$3 for AMDEK 3" disks.)

HUMBUG-64

Reduced from \$59.95 to \$49.95. This version is specially configured for 64K disk systems using either Flex or STAR-DOS. (Add \$3 for AMDEK 3" disks.)

REBATE

Buy your Star-Kits software from a dealer, and get an extra savings by sending us your registration form and a copy of your sales slip or invoice. The rebate is \$10 on software priced over \$50, and \$5 for software under \$50. The rebate is in effect until December 24, 1983.

ILLEGITIMACY PROGRAM

If you have an illegitimate (ahem...pirated) copy of a Star-Kits program, we offer you an amnesty as part of our Illegitimacy Program. Send us (a) a working copy of the program, (b) details on where and from whom you got it (with adequate identification of the source), and (c) 25% of the current list price, and we will send you (a) the latest up-to-date copy of the program, (b) a complete and up-to-date manual, and (c) a sales slip welcoming you to the world of happy Star-Kits customers. A small price to pay for a clear conscience?

MC-10 SPECIAL

To celebrate Star-Kits' being first with MC-10 software, here's our MC-10 Triple-Pak: MC-10 HUMBUG (normally \$29.95), MC-10 REMOTERM (normally \$19.95), and MC-10 COMMTERM (a brand new terminal communications program which sells separately for \$19.95), a total value of \$69.85, all for a special price of just \$55.

STAR-KITS

P.O. BOX 209 — J
MT. KISCO, N.Y. 10549
(914) 241-0287

product; if so, we try again with another reviewer. Often the producer is willing to make changes to make it a decent product. If the product needs more work, and they are accomplishing this, we "hang loose", and the Review does not get published. If we even get a SUGGESTION that the producer is trying to hide a bad product with fancy advertising, YOU will HEAR ABOUT IT; ASAP.

It boils down to this; if the Review is published in Color Micro Journal, you know what you are getting. If you do NOT see it in CMJ, either we do not have it to Review, it is in a "hold pending improvement" state, or it is "in process", meaning either that we are looking for a VALID Reviewer, or that it is now being reviewed.

YES, WE ARE LOOKING FOR REVIEWERS! If you think you would be interested, send me a "review" of something you have as a sample of what you can do, and let me know what your interests are and what your Computer Configuration is (amount of memory, disk, tape, printer, etc.). We would PREFER that you send a "Text" File (DAT File in Radio Shack terminology), either on Tape or Disk, in Radio Shack, FLEX, or OS-9 Format, with NO imbedded Control Codes (just leave a blank line for paragraph separation); and possibly a print-out so we can see how you intended the article to be formatted. Your return as a reviewer will be some new products, which are normally yours to keep, and a small amount of reimbursement (that means "money", y'all) to help defray your expenses.

— RLN —

COCO 2 HARDWARE NOTES

HARDWARE NOTES FROM UNDER THE COCO 2 COVER

Radio Shack has introduced a new version of its successful Color Computer. The new Color Computer 2 is fully software compatible with all current Radio Shack software, but third party software and hardware compatibility is another story.

Major design changes have taken place under the COCO 2 cover. To start with, Radio Shack has completely eliminated the 12 volts from the Color Computer 2; it runs almost entirely on +5 volts. The only negative voltage is for the RS232 interface. They have replaced the dynamic 16K chips with 4517 chips. These are 16K counterparts that require only +5 volts. Piggyback upgrades for the older computers will not work here. Other hardware items that will not work "as is" include the RS X-PAD, Eeprom Programmers, Video Interfaces, Microtext, old RS Disk Controllers, and Speech Synthesizers. The COCO 2 power supply is now a simple center-tapped transformer with a fuse hard wired into the primary. Take note that CR7 and CR8 are special diodes that have no direct substitutes. These parts can only be obtained through Radio Shack National Parts.

The most obvious external change is the size of the computer and the keyboard. The COCO 2 is smaller than the older Color Computers, measuring 13 3/4" W x 9 1/2" D x 2 3/4" H. The case is no longer "battle ship gray", but a pleasing off-white. The keyboard is still of the conductive rubber type, but has larger, nicer key caps. This is a disappointment, as I thought it would be changed to the mechanical type. The air vent holes are across the rear top of the cover like the "infamous" TDP computers.

Looking inside reveals more interesting changes. To upgrade to 64K is now as simple as 1-2-3! All one has to do is remove the (8) 4517 chips and replace them with (8) 4164 chips. Between IC chips U6 and U7 is W1. Run a jumper wire across the solder feed through holes to the right where W1 is marked and VIOLA, you now have 64K! No more capacitors or traces to cut and no pins to bend up. Old "D" board owners wish they had it as easy. Looking further reveals the absence of the Astec RF Modulator. This is because the MC1372 Video Mixer chip is now being used as both a Video Mixer and RF Modulator. Due to a new redesign in the VDG circuitry, colors

from Semigraphics 6 mode do not appear. This again has no effect on RS software, only third party software.

All Color Computer 2's have the new 1.2 BASIC ROM and 1.1 Extended Basic ROM. The new Color 2 Disk Drive Kits (26-3029) contains the new 1.1 Disk ROM reconfigured to work with OS-9. The 1.0 Disk ROM's will work with OS-9, but require the cumbersome task of always inserting a boot disk. With the new 1.1 Disk ROM, all you have to do to boot OS-9 is type DOS. OS-9 is a sophisticated operating system with Multi-User and Multi-Tasking capabilities. It requires 64K RAM, but considering the ease of upgrading and the low cost of 64K chips (\$44.95), many COCO 2 owners will soon be exploring the powers of OS-9.

Radio Shack has done some job in bringing in an exciting new COCO product line. Besides the Color 2 and OS-9, there are now Multi-Pak Interfaces, RS-232 Program Paks, Color Mouses, Deluxe Joysticks, Color Ink Jet Printers, and soon to come in 1984 the much rumored "SUPER COCO". We'll leave that one alone for now. You do like surprises don't you?

Bob Rosen

STAR - KIBBITS

My dictionary defines 'deja vu' as the mistaken feeling that you've seen something before, when you really have not. But if you had the feeling last month that you had seen my Kibbitz chat before, it wasn't *deja vu*! You really did see it — the month before that. As you can imagine, writing a new column each month can get somewhat hectic, especially as the deadline approaches... and passes. If this were just a plain article, the magazine could simply put in a note like "Mr. Stark's column will not appear in this issue, and will resume next month." But with an advertisement it's not that simple. I suppose we could have left this space empty...

STAR-DOS PRICE REDUCTION

Our STAR-DOS 64 has had such a good reception that we have decided to permanently drop the price. From now on, the regular STAR-DOS (for 16K and 32K systems) and STAR-DOS 64 (for 64K systems) are being bundled together into a single package which we will call STAR-DOS, and which will have the combined price of \$49.90.

Despite the release of OS-9 (a trademark of Microware Systems Corp.) and Flex (a trademark of Technical Systems Consultants) for the CoCo, we expect the popularity of STAR-DOS to keep rising for two very simple reasons. First, STAR-DOS is the only DOS which supports the standard Radio Shack CoCo disk format. Though we all hear about the large amount of software available for Flex and OS-9, the fact of the matter is that there are more programs available for the standard CoCo disk format than for OS-9 and Flex together.

Second, since OS-9 and Flex are also incompatible with regular CoCo Disk Basic, you must buy another Basic to get their full benefits. Not so for STAR-DOS, which can read and write the same files as Disk Basic can.

There is a good number of serious users of STAR-DOS among you; in fact, we have even licensed STAR-DOS to other software developers for inclusion in their own products. We're so enthusiastic about the future of STAR-DOS that we're willing to make you an offer you can't refuse: If you now have a DOS, any DOS for any machine, send it to us and we will trade you for a copy of STAR-DOS. Please — original documentation and disks only, and include \$3 for shipping.

To know STAR-DOS is to love it!

COMMTERM IS NOW FREE!

COMMTERM is our communications terminal program for the CoCo and MC-10. You can now get it FREE if you send us a cassette and a stamped self-addressed envelope (with three stamps). After you get it and use it, decide what it is worth to you, and then pay us whatever you like. You have our permission to copy the program and documentation as much as you want, and give it away to anyone you like, providing that you don't make any changes to it. It's a new marketing approach, and we're curious to see what happens.

ARE YOU A PRIVATE PILOT?

If so, then you may be interested in a VFR Flight Planning program for the CoCo, available for \$24.95 for tape, or \$29.95 for disk, from Frank Lombardi, P.O. Box 373, South Salem, NY 10590. That's it for now — see you next month.

SPELL 'N FIX

Regardless of whose text processor you use, let SPELL 'N FIX find and fix your spelling and typing mistakes. It reads text faster than you can, finds spots and corrects errors even experienced proofreaders miss. It is compatible with all Color Computer text processors. \$69.29 in the Radio Shack disk or cassette versions; \$178.58 in the Flex version. (20,000 word dictionary is standard, optional 75,000 word Super Dictionary costs \$50 additional.)

HUMBUG® — THE SUPER MONITOR

A complete monitor and debugging system which lets you input programs and data into memory, list memory contents, insert multiple breakpoints, single-step, test, checksum, and compare memory contents, find data in memory, start and stop programs, upload and download, save to tape, connect the Color Computer to a terminal, printer, or remote computer, and more. HUMBUG on disk or cassette costs just \$39.95, special 64K version for FLEX or STAR-DOS 64 costs \$59.95, MC-10 version \$29.95.

STAR-DOS

A Disk Operating System specially designed for the Color Computer, STAR-DOS is fully compatible with your present Color Computer disk format — it reads disks written by Extended Disk Basic and vice versa. STAR-DOS for 16K through 64K systems costs \$49.90.

STAR FLEX

The best implementation of FLEX for the Color Computer. Complete with all utilities, text editor, macro assembler, and HUMBUG debug monitor, \$225.00.

ALL IN ONE — Editor Etc.

Three programs in one — a full function Editor, a Text Processor and a Mailing List/Label program. All this for just \$50. Requires STAR-DOS, or FLEX, specify which.

DBLS for Data Bases

DBLS stands for Data Base Lookup System. A super-fast system for searching for a selected record in a sequential disk file. Supplied with SPELL 'N FIX's 20,000 word dictionary as a sample data file — lets you look up the spelling of any word in under FOUR seconds. Priced at \$29.95. Requires STAR-DOS.

CHECK 'N TAX

Home accounting package combines checkbook maintenance and income tax data collection. Written in Basic for either RS Disk or Flex, \$50.

REMOTERM

REMOTERM — makes your CoCo into a host computer, operated from a remote terminal. \$19.95, disk or cassette.

NEWTALK

NEWTALK — a memory examine utility for machine language programmers which reads out memory contents through the TV set speaker. \$20, disk or cassette.

SHRINK

SHRINK — our version of Eliza, in machine language and extremely fast. \$15, disk or cassette.

EDUCATIONAL SOFTWARE

Introduction to Numerical Methods — college level course on computer math, \$75.00, disk or cassette.

We accept cash, check, COD, Visa, or Master Card. NY State residents please add appropriate sales tax. Add \$3 to above price for AIMDEK 3" disk versions.

(FLEX is a trademark of Technical Systems Consultants, Inc. Everything else in this ad is a trademark of Star-Kits.)

STAR-KITS SOFTWARE SYSTEMS CORP.

P.O. BOX 209 — J
MT. KISCO, N.Y. 10549
(914) 241-0267

DSL COMPUTER PRODUCTS INC.

GAMES

DEATH TRAP	19.95 (C)
CATERPILLAR	19.95 (C)
HAPPY HURDLER	12.95 (C)
POLARIS	29.95 (R)
SPACE ASSAULT	29.95 (R)
SHARK TREASURE	24.95 (C)
KEYS OF THE WIZARD	19.95 (C)
MUDPIES	29.95 (C)
TRAFFALL	27.95 (C)
AIR TRAFFIC CONTROLLER	28.95 (C)
GRABBER	27.95 (C)
SPACE SHUTTLE	28.95 (C)
DEVIL ASSAULT	27.95 (C)
BUZZARD BAIT	27.95 (C)
THE KING	26.95 (C)
BLACK SANCTUM	19.95 (C)
CALIXTO ISLAND	19.95 (C)
EL BANDITO	24.95 (C)
GLAXXONS	24.95 (C)
ASTRO BLAST	24.95 (C)
SHENANIGANS	29.95 (D) 24.95 (C)
SPACE RAIDERS	24.95 (C)
CAVE HUNTER	24.95 (C)
STARSHIP CHAMELON	24.95 (C)
DOODLEBUG	24.95 (C)
STAR BLASTER	39.95 (R)
EL DIABLO	24.95 (C)
STORM	24.95 (C)
ROBOTTACK	24.95 (C)
THE FROG	38.95 (D) 27.95 (C)
GALAX ATTAXX	21.95 (C)
DEFENSE	21.95 (C)
COLORPEDE	29.95 (C)
MAZE RACE	14.95 (C)
BIRD ATTACK	21.95 (C)
ANDROID ATTACK	21.95 (C)
COLOR HAYRIDE	24.95 (C)
BALLOON ATTACK	29.95 (D) 24.95 (C)
COLOR DFT	25.95 (C/D)
COLOR FURY	27.95 (C)
CASHMAN	27.95 (C)
OUTHOUSE	27.95 (C)
AIRLINE	24.95 (C)
AREX	34.95 (C)
ZAXXON	39.95 (C)
POOYAN	29.95 (C/D)
MOON SHUTTLE	29.95 (C/D)

EDUCATIONAL

MATH DRILL	19.95
SPELLING TEST	19.95
WORD DRILL	19.95
ESTIMATE	19.95

ACCESSORIES

MANOS CARD	4.95
EPSON RIBBONS	7.49
BLACK, BLUE, RED, BROWN, GREEN	
C-10 DATASETTE	1.25
C-20 DATASETTE	1.50
GEMINI RIBBONS	2.95
LP VII, DMP 100, TPI RIBBONS	4.95
DISK MAILERS	0.95
10 PACK	8.95
DISK SAVERS	.59
12 PACK	5.95
DISKS	
SENTINEL 55/SD	19.95
SENTINEL 55/DD	22.95
VERBATIM	34.95
DISK DOUBLER	11.95
GRAND SLAM 64K KIT	75.00
16-32K RAM SLAM	49.95
2 WAY RS 232 SWITCHER	29.95
3 WAY RS 232 SWITCHER	39.95
4 TO 4 PIN CABLE	4.95
CASSETTE CABLE	5.95
MASTER CONTROL II OVERLAY	2.50
64 K RAM BUTTON	2.95
BOTek INTERFACE	59.95
FOR EASON	69.95
MD KEYBOARD	69.95
MULTI PACKS	
DSL GREATEST HITS	
TAPE	39.95
DISK	49.95
COLOR LOAD 80	
VOLUME II	9.95
VOLUME III	9.95
RAINBOW ON TAPE	
DEC. 83	6.50
NOV. 83	6.50
OCT. 83	6.50
SEPT. 83	6.50

UTILITIES

COLOR GRAPHIC EDITOR	19.95 (C)
SUPER SCREEN	29.95 (C)
GRAPHIC SCREEN PRINT	
EASON	9.95 (C)
OKIDATA	9.95 (C)
GEMINI	9.95 (C)
PROWRITER	9.95 (C)
LP VII/RS	7.95 (C)
LOGICAL DISK COPY	14.95
EDTASM +	49.95 (R)
TAPE DIRECTORY	14.95 (C)
TAPE TO DISK	17.95 (C)
DISK TO TAPE	19.95 (C)

APPLICATION

THE GENERAL	TAPE	39.95
	DISK	49.95
DISK MAILER		24.95
TELEWRITER	TAPE	49.95
	DISK	59.95
SUPER COLOR WRITER		59.95
TAPE OR DISK		
PERSONAL FINANCE		39.95 (R)
ELECTRONIC CALLIGRAPHER		10.95 (D)
SUPER CONTESTER I		14.95 (C)
SUPER CONTESTER II		24.95 (C)
COUNTRY LOCATOR		14.95 (C)

HARDWARE

32/64K TDP 100	219.00
32/64K EXT TDP	309.00
32/64K CC2	209.00
32/64K EXT CC2	299.00
TDP LINE PRINTER I	249.00
GEMINI STX 80	199.00
GEMINI 16X	349.00
GEMINI 15 X	499.00
CASSETTE RECORDER	49.95
STD. JOYSTICKS	10.00
ATARI JOYSTICKS	14.95
DISK DRIVE 8	349.00
DISK DRIVE 1.2, OR 3	249.00
DUAL HALF HEIGHT	499.00
MODEM I	99.00

CLOSE OUTS

CO RESS V.14 E/A	14.95 (C)
COSMIC SUPER BOWL	7.50 (C)
WAR KINGS	9.95 (C)
MAGIC BOX	12.49 (C)
ANIMATED HANGMAN	6.50 (C)
SPACE INVADERS	10.95 (C)
DANCIN DEVIL	4.95 (C)
BUSTOUT	5.00 (R)
TYPING TUTOR	9.95 (C)
STAR BLASTER	19.95 (R)
POCKET COMPUTER WITH PRINTER & EXTRAS	150.00

P.O.BOX 1113 • DEARBORN, MI 48121
313-582-8930 • 313-582-3406 (Data)

Michigan Residents Add 4% Sales Tax To Order

Please include \$3.00 for R & H



Color Micro Journal™

5900 Cassandra Smith Rd. ★

Hixson, TN. 37343

COLOR MICRO JOURNAL™ Is A Monthly
Tabloid Publication for Color Computer USERS!

★★

COLOR MICRO JOURNAL™ is a Magazine FOR
Color Computer Users BY Color Computer Users. Col-
umns on various compatible Operating Systems, Lan-
guages, Uses (Bulletin Boards, Clubs, using the RS
BASIC, and so on), etc.

★★★

Programs - Games - Reviews - Education - Hardware -
Software - New Product Announcements - Books

★★★★

Get the MOST from your COLOR COMPUTER
without being an Engineer.

DON'T MISS A SINGLE ISSUE
Subscription Rate of only \$16.50 a Year!!!

★★★★★

COLOR MICRO JOURNAL™ published by the
ONLY pure 68xx, INTERNATIONAL Computer Maga-
zine. '68 Micro Journal has provided coverage for over
FIVE Years. We KNOW the Color Computer, the Soft-
ware (both FUN and WORK) that IS and CAN BE run on
it. We KNOW the products that ARE, CAN BE, or
WILL BE used on the Color Computer.

For Ordering Subscriptions By Phone
Call 1-800-338-6800



Color Micro Journal

Limited Time Charter Rates

USA - \$16.50 per year. Canada & Mexico - \$23.00 per year

Surface Foreign - \$28.00 per year. Airmail Foreign - \$52.00 per year

*Color Micro Journal is a trademark of Computer Publishing Inc.

- Yes! Start my copy of Color Micro Journal coming as soon as possible!
-
-
- Name _____
- Address _____
- City _____ State _____ Zip _____
- Visa Master Card Check or Money Order Enclosed
- Card # _____
- Exp/Date _____

COMPUTER OPERATING SYSTEMS

Continued from page 1

in electronics have produced more powerful Computers for less money, the development of Computer Operating Systems has been the real factor in the growth of the Computer Industry.

The earliest Microcomputers had a multitude of switches and lights on the front panel, which the operator used to control the Computer. Some of the switches provided a means for the operator to "Input" information into the Computer, while the lights indicated the "Output" from it. To operate the Computer, the operator turned the machine on and proceeded to insert a program by setting the Input switches, pushing a button to cause that code to be "entered", set the switches to another code, enter that, etc. After an hour or two of setting and entering the switches, he had installed a small program that might read ANOTHER set of switches and perform some function, depending on their settings. He could see if the program worked correctly by reading and decoding the lights. This was all done in BINARY, and required many hours of "programming" to get a simple program installed just to read and react to a particular set of switch settings (consider that several HUNDRED lines of code are involved with the simple BASIC STATEMENT: PRINT "HELLO"). Obviously, this did not lead to "efficient" use of the Computer.

The users of those first Computers were hobbyists whose interests lay primarily in the Digital Electronics area. By entering a program through the switches, they were developing the first rudiments of a **Microcomputer Operating System** (they were developing what we now refer to as a "Monitor" Program; a term used for Programs which allow the User to work DIRECTLY with the Machine Language of the Computer). Since the setting of the switches was extremely time consuming, and had to be accomplished every time the Computer was turned on, a better method of entering the programs and reading the output (i.e., "communicating" with the Computer) was needed.

The next step was to install a 16 or 20 Key Keypad for the Input, and some type of Display, such as the Seven-Segment LED Readouts (such as is used with the Heathkit ET-3400 Microprocessor Trainer). Now, the data could be entered much faster, by entering Hex Data through the Key Pad (with, possibly, a few "special function" keys for GO, ENTER, STOP, SINGLE-STEP, etc.), and the Readout could be displayed directly as Hex Info, eliminating the need to convert from Binary all of the time. This required a Monitor Program which could interpret each Key and install the correct information in the right location in memory, and routines to convert and hold the output to be displayed on the Displays. The user still had to hand code each program in Machine Language, and enter each program from the Key Pad before he could execute it, but this was still

many times faster than setting individual switches.

Progress rapidly moved from those beginnings to Teletype machines which provided a full Keyboard Input and a Printer Output, Mass Storage Systems such as Tape Units so that the program could be saved and reloaded in seconds or minutes instead of hours, on through to the Systems that we have today with Keyboard Input and a CRT or TV Output in "English Language", Disk Systems which allow saving and loading programs in milli-seconds instead of minutes, etc. The lower cost Computer Systems provide the complete Operating System in ROM (Read-Only Memory), while the larger and more flexible Systems provide a small ROM'd Monitor which allows reading the desired Operating System off of Disk when the Computer is first turned on.

Each step forward in "Hardware" development required parallel advancements in the Software (or vice versa). These developments provided a means for the Computer Operator to communicate with the machine in a more and more "natural" manner. As time went on, and experience was gained in using Computer Systems, the Operating Systems became more and more Powerful and "User Friendly", accepting English Language Statements such as "Load", "Save", "Print", etc. This capability made the Computer accessible to more and more users.

More Users led to the development of different Computers, but a Program written for one Computer would not run on another Computer. The need arose for an Operating System that would allow one program to be written that



ANALOG MICRO SYSTEMS
5660 Valmont Road
Boulder, Colorado 80301
(303) 444-6809

ROBOT-1

Computer Servo Controlled Robot Arm

**Keyboard or Joystick Control;
Plugs Into Your Co Co;
Remembers Everything
It Did -
Does It Again!**

**Includes All Software:
Includes Power Supply,
6 Channel Servo
Controller,
Robot-1 and Cables
Order Robot 1-C
\$395.00**

**Also SS-50 Version
Available
Order Robot-1S
\$395.00**

Free Catalog

TEN MOST-ASKED QUESTIONS about DYNACALC™ THE ELECTRONIC SPREAD-SHEET FOR 6809 COMPUTERS

1. What Is an electronic spread-sheet, anyway?

Business people use spread-sheets to organize columns and rows of figures. DYNACALC simulates the operation of a spread-sheet without the mess of paper and pencil. Of course, corrections and changes are a snap. Changing any entered value causes the whole spread-sheet to be re-calculated based on the new constants. This means that you can play 'what if?' to your heart's content.

2. Is DYNACALC Just for accountants, then?

Not at all. DYNACALC can be used for just about any type of job. Not only numbers, but alphanumeric messages can be handled. Engineers and other technical users will love DYNACALC's sixteen-digit math and built-in scientific functions. You can build worksheets as large as 256 columns or 256 rows. There's even a built-in sort command, so you can use DYNACALC to manage small data bases — up to 256 records.

3. What will DYNACALC do for ME?

That's a good question. Basically the answer is that DYNACALC will let your computer do just about anything you can imagine. Ask your friends who have VisiCalc™, or a similar program, just how useful an electronic spread-sheet program can be for all types of household, business, engineering, and scientific applications. Typical uses include financial planning and budgeting, sales records, bills of material, depreciation schedules, student grade records, job costing, income tax preparation, checkbook balancing, parts inventories, and payroll. But there is no limit to what YOU can do with DYNACALC.

4. Do I have to learn computer programming?

NO! DYNACALC is designed to be used by non-programmers, but even a Ph.D. in Computer Science can understand it. Even experienced programmers can get jobs done many times faster with DYNACALC, compared to conventional programming. Built-in HELP messages are provided for quick reference to operating instructions.

5. Do I have to modify my system to use DYNACALC?

Nope. DYNACALC uses any standard 6809 configuration, so you don't have to spend money on another CPU board or waste time learning another operating system.

Order your DYNACALC today!

Foreign Dealers:

Australia & Southeast Asia: order from Paris Radio Electronics, 161 Bunnerong Road (PO Box 580) Kingsford, 2032 NSW Australia. Telephone: 02-344-9111.

United Kingdom: order from Compusense, Ltd., PO Box 169, London N13 4HT. Telephone: 01-882-0681.

Scandinavia: order from Swedish Electronics Inc AB, Murargatan 23-25, Uppsala S-754 37 Sweden. Telephone: 18-25-30-00.

6. Will DYNACALC read my existing data files?

You bet! DYNACALC has a beautifully simple method of reading and writing data files, so you can communicate both ways with other programs on your system, such as the Text Editor, Text Processor, Sort/Merge, STYLOGRAPH™ word processor, RMS™ data base system, or other programs written in BASIC, C, PASCAL, FORTRAN, and so on.

7. How fast Is DYNACALC?

Very. Except for a few seldom-used commands, DYNACALC is memory-resident, so there is little disk I/O to slow things down. The whole data array (worksheet) is in memory, so access to any point is instantaneous. DYNACALC is 100% 6809 machine code for blistering speed.

8. Is there a version of DYNACALC for MY system?

Probably. You need a 6809 computer (32k minimum) with FLEX™, UniFLEX™, or OS-9™ operating system. You also need a decent crt terminal, one with at least 80 characters per line, and direct cursor addressing. If your terminal isn't smart enough for DYNACALC, you probably need a new one anyway. The UniFLEX and OS-9 versions of DYNACALC allow you to mix different brands of terminal on the same system. There's also a special version of DYNACALC for Color Computers equipped with FLEX (Frank Hogg or Data-Comp versions).

9. How much does DYNACALC cost?

The FLEX versions are just \$200 per copy; UniFLEX version \$395; OS-9 version (works with LEVEL ONE or LEVEL TWO) \$250. Orders outside North America add \$7 per copy for postage. We encourage dealers to handle DYNACALC, since it's a product that sells instantly upon demonstration. Call or write on your company letterhead for more information.

10. Where do I order DYNACALC?

See your local DYNACALC dealer, or order directly from CSC at the address below. We accept telephone orders from 10 am to 6 pm, Monday through Friday. Call us at 314-576-5020. Your VISA or MasterCard is welcome. Please specify diskette size for FLEX or OS-9 versions. Software serial number is required for the UniFLEX version.

Computer Systems Center
13461 Olive Blvd.
Chesterfield, MO 63017
(314) 576-5020



UniFLEX software prices include maintenance for the first year.

DYNACALC is a trademark of
Computer Systems Center

VisiCalc is a trademark of VisiCorp.
STYLOGRAPH is a trademark of Great Plains Computer Co.
RMS is a trademark of Washington Computer Services.
FLEX and UniFLEX are trademarks of TSC.
OS-9 is a trademark of Microware and Motorola.

could, run on several different kinds of Computers. While the Computer Operator needed to be able to communicate with the computer in a language HE (or SHE) could understand, the PROGRAM also needed a common interface that IT could understand. Over a period of time, a few Operating Systems floated to the top, such that, once it was installed on a Computer, ANY Program that was written to run with that Operating System, and which used the System provided Input/Output locations, would run on ANY Computer that used that Operating System. Some of the well known Operating Systems that evolved are CP/M (in its MANY variations) for the '80 Series CPU's, FLEX for the '68 Series CPU's, and now, OS-9, a Multi-User, Multi-Tasking Operating System for the 6809.

To get a clearer picture of this concept, imagine that the different States in the U.S. are different Computers; that the Highway System is an Operating System; and that various vehicles (cars, trucks, etc.) are the different Programs. The Highway System is "Standardized"; the roads are at least a certain width, there are no brick walls or large ditches across them, etc. As long as the cars and trucks are built to run on this type of surface, they can be used to go to any State in the U.S. Some are large and some are small, some are built to carry a few people and some are built to carry large loads, but ALL are built to run on the Highway System. The Railway System is a different "Operating System", cars and trucks can not run on it; a different type of vehicle is required to run on this System. Likewise, a Radio Shack Program will not run under FLEX or OS-9, or a FLEX Program will not run under Radio Shack or OS-9, etc., because they are DIFFERENT Operating Systems.

A very basic Operating System, such as that provided by Radio Shack with the Color Computers, will allow the User to functionally control the various systems that are a part of the overall Computer System, such as the Tape System, Printer, Display, Disk System, etc. More powerful Operating Systems provide the User with greater capabilities in the operation and control of the overall Computer System, including User Control of the Input and Output of Programs (rather than being tied down to only what the Program was written to accomplish), on up to providing Multi-User and Multi-Tasking Operations, Real-Time Operating Systems for Industrial Control Systems etc.

As with any engineering project, there are always trade offs. An increase in Operating System capability means that the use of the System will be more complex and that more memory and other items, such as Disk Drives, will be required to handle the added capabilities.

Basically, then, a Computer Operating System is a Program, or system of Programs, which provides the Computer System USER with an easy means of communicating with, and controlling, the Computer System itself; and also provides a "Standard" interface for Programs. The Computer Chip only understands combinations of ON and OFF; an Operating Systems is required to interpret the Users' English Language statement into a form that the Computer can understand. If

you enter CLOAD "GAME" on the Color Computer, the Operating System determines that you want to load a Program from the Tape System, then turns on the Tape System, finds the Program on the Tape, gets the information off of the Tape, turns off the Tape System, and lets you know that it has either accomplished the task or run into some problems. It also had to put the information it read from the Tape into the proper place in Memory, in the proper format, and set the Computer System up so that Program could be run. Also, a Programmer can use, for example, the built-in Tape Operation functions, so he does not have to program these features into a Program he is writing to run with this System. Obviously, if we did not have the simple Operating System that Radio Shack provides with the Color Computer, there would not be very many of us that could actually USE the Computer.

Color Computer Operating Systems

There are now three (3) MAJOR Operating Systems available for the Radio Shack Color Computer; in order of power, flexibility, and complexity, they are

Radio Shack

FLEX

OS-9

The Radio Shack Operating System could be broken down into a "Tape-Based" Operating System in the BASIC and Extended BASIC ROM's, and a "Disk-Based" Operating System with the Disk BASIC ROM (Disk Operating Systems are normally referred to as a DOS). This Operating System is closely tied to the BASIC Language provided with the Computer.

Both FLEX and the Color Computer OS-9 are Disk Operating Systems, and are complete "Stand Alone" Programs in themselves; i.e., they are separate Programs that you load and execute just like you would a Color Computer Game. When they are executed, the normal Radio Shack Operating System and BASIC disappear, and are not usable until you turn the Computer off and turn it back on again. If you want to use the BASIC which runs under FLEX, you must obtain the Program, BASIC (or XBASIC), and execute it just like you would a Word Processor or Accounting Program. If you want to use BASIC with OS-9, you must obtain Basic09, which is just another Program that runs under OS-9.

The Radio Shack Tape and Disk Operating Systems are obviously the "STANDARD" Operating Systems for the Color Computer, because every Color Computer built contains that Operating System. FLEX and OS-9 are the primary Disk Operating Systems of most of the 6809-Based Business Computer Systems. FLEX has been around the longest, and supports a multitude of good working Software. OS-9 has been operational about three years, and has exceptionally powerful Software Development software support (Basic09, Pascal, COBOL, C, and a special OS-9 oriented Assembler); some good "Working" Software is now beginning to appear.

The Radio Shack Operating System is the simplest and easiest to use, but has very little user flexibility and power. For example, the only method provided for use of the Printer is through the BASIC Programming Language. For the average Single-User Computer

System in a Home or Business Environment, FLEX is unbeatable. It uses a simple, consistent Command Syntax and a Disk Structure that is flexible, yet reliable (and, in most cases, REPAIRABLE, should something happen to the Directory). OS-9 is far and away the most powerful of the 6809 Operating Systems (in fact, it is more Powerful and Easier to Use than most of the 16-Bit Operating Systems available to most of the other Microcomputer Users). Based on the UNIX Operating System, the operator has TOTAL CONTROL of the Computer and Programs from the Command Line. While it may appear to be confusing by just reading the Manual, OS-9 is easy to learn by just setting down at the Computer and working with it a little while. OS-9's Disk Directory System provides excellent User flexibility, but a "blown Directory", like the Radio Shack Disk structure, is usually FATAL (i.e., non-repairable).

The Radio Shack Operating System is ROM Based, providing immediate response to a Command, but the inclusion of the BASIC Programming Language in the ROMs, along with the memory limitations, restrict the capabilities and flexibility of these Commands. The design of the Operating System, coupled with the fact that it is in ROM, severely restricts the flexibility of the System in that it is hard to add "System Commands", or change those that are provided. On the other hand, the Hardware design of the Color Computer, and especially the capabilities of the 6883 SAM Chip, provide a flexibility unheard of in any other Computer System, and allow the easy installation of more powerful Operating Systems. Where else can you get a Computer for about \$300, and expand it as you learn into a full UNIX style Disk Operating System?

The FLEX Disk Operating System is a Program which provides much greater User control and flexibility in using the Computer as a working "Tool". FLEX is strictly a "Disk Based" Operating System (i.e., it is ONLY used with Disk Systems) which resides in high Memory beginning at \$C000 (the same address as the Color Computers' Cartridge Slot and Disk ROM). This means that to run FLEX (or the Color Computer OS-9), you MUST have BOTH 64K of RAM and a Disk System. As was mentioned previously, when FLEX (or OS-9) is brought up on the Color Computer, all of the Radio Shack System disappears. FLEX then provides all of the interface between the User (and most Programs) and the Computer itself.

FLEX has a couple of "built in" Commands, but almost all of the FLEX Commands are "Disk Resident"; that is, when a Command is given, it loads it off of the Disk and executes it. FLEX provides some space within the Operating System for these Command Programs to load and run so that they will not interfere with a Program that the User may be running, such as BASIC or an Editor or Word Processor. This allows both the User and the Program to use the System Commands (small Programs that perform a "System" function, such as reading a disk directory, list a file, delete a file, etc., are normally called "Utilities") without leaving the Program itself. Also, by having the Commands on Disk, where they are accessible, they can be easily changed, it is easy to add new Commands to the System, memory space is not tied up, etc. FLEX allows information in a Disk File to be listed to the Display or Printer to examine its

Sugar
Software



\$24.95

Tape Information
Management System

A user-oriented, easy to use personal database management system for the TRS-80® Color Computer with these outstanding features:

- keeps files of programs, names, addresses, birthdays, recipes, class or club rosters, etc.
- variable record and field lengths
- phrase substitution editor
- up to 8 user-definable fields
- ML sort (up to 3 fields), search and delete functions
- user-definable printer format, for any printer
- up to 230 characters per record

Price includes the database management system, full documentation including a reference guide and 1981 Bibliography of Color Computer articles.

Requires 16K Extended Basic. 32K recommended.

1982 TIMS Bibliography - \$9.95.



\$19.95

The TIMSMAIL mailing list manager has most of the fine features of TIMS as well as these special mailing label features:

- user selected label formats
- continuous or single sheet
- designed for 80 column printer
- 1, 2 or 3 labels wide
- 2.5, 2.75, 3, 3.5 and 4 inch labels
- select fields to print
- select records to print
- fast ML search, sort (up to 3 fields) and delete routines

Requires 32K Extended Basic



\$19.95

Auto Run is a utility program for the TRS-80® Extended Basic Color Computer. It is used to add convenience and professionalism to your software.

Auto Run will help you create your title screen with the graphics editor. The graphics editor allows you to choose a background color and border style. Using the arrow keys and several other commands you can draw pictures, block letters and also include text.

Auto Run will generate a machine language loader program to precede your program on the tape. Then, to start up your program, simply type CLOADM to load in the Auto Run loader program, which will then automatically start itself up, display your title screen, load your program and then RUN or EXEC it.

Also you may record a vocal or musical introduction preceding your program. The Auto Run loader will control the audio on/off.

Basic programs can be set to load anywhere in memory above the PCLEAR 0 page.

Software authors: The Auto Run prefix may be appended to your software products.

Price includes complete documentation and assembly source listing.

Requires 16K Extended Basic.

Galactic Hangman

\$17.95

A great new twist to the popular educational word guessing game for the Color Computer. Large (700 words) and sophisticated vocabulary. Or enter your own words, your child's spelling list, foreign language vocabulary, etc.



Outstanding high resolution graphics, animation and sound effects.

Price includes both 16K and 32K versions.

SUGAR SOFTWARE
2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

CIS orders EMAIL to 70405, 1374

*TRS-80 is a trademark of Tandy Corp.



PIRATECTOR!

\$99.95

Our disk-based antipiracy applications development system has these features:

- Protect your disk software from piracy
- Users can create (non-executable) backups
- Protects ML or Basic programs
- Your program is encrypted, which prevents listing or disassembly
- Loader displays graphic title screen, then loads and starts your program
- Incrementing serial numbers and other user data supported
- Automatic generation of copies from your master for 2 (or more) disk drives
- Disk initialization
- Copy all files from master to target
- Protect up to 5 programs on target disk
- 100% Machine Language
- Easy to use full-screen menu oriented
- User subroutines
- User subroutines may be LOADMed
- Usable by ML or Basic
- Border drawing routine
- Keyboard input routine ideal for your programs
- Position independent
- Break key disable for Basic programs
- Title screen graphics editor to create your own title screen
- High resolution
- Semigraphic modes 8, 12 and 24 (64x64, 64x96 and 64x128)
- 8 colors
- Combine text with graphics
- Load, display, save graphic title screens made with other graphics editors
- Protect demo disks you send out



\$19.95

Disk Version - \$24.95

Disk version with all 62 stories - \$49.95

A sensational and educational version of a popular party game for the TRS-80® Color Computer... For 1 to 10 players. Load a story into the computer. The players are asked to supply a noun, verb, part of body, celebrity, etc. which the program uses to complete the story. The story, which is displayed when all words are entered, will be hilarious.

Price includes Silly Syntax game, user guide and 2 stories.

Requires 16K Extended Basic (32K for disk).

You can create your own stories or order story tapes from the selection below.

Each story tape is \$9.95.

Silly Syntax stories - Ten stories per tape.
SS-001 - Fairy Tales SS-004 - Current Events
SS-002 - Sing Along SS-005 - Adventure/Sci-Fi
SS-003 - X-Rated SS-007 - Polypom

NEW

PREREADER \$19.95 Disk - \$24.95

Help your preschool age (3-5) child learn to read with this easy to use menu-driven program. Great high resolution graphics, colors and sound effects. Includes capital and small letters, numbers, shapes and colors, much more! Requires 32K Extended Basic and joysticks.

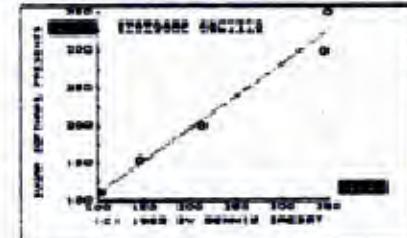
NEW

STATGRAF \$24.95

Disk - \$29.95

STATGRAF is a linear regression analysis package combined with sophisticated high resolution plotting/line graphing. Features include: allows entry of up to 250 pairs of (x,y) data, transforms observations using logarithmic, square root, inverse exponential or additive codes, plots any number of data sets on a single graph, type information directly onto the graph in 3 orientations.

Requires 32K Extended Basic.



Add \$1.00 per tape or disk for postage and handling. Ohioans add 5.5% sales tax. C.O.D. orders are welcome. Dealer inquiries invited.

The Original FLEX™ for Color Computers

- Upgrade to 64K
- RS to FLEX, FLEX to RS file transfer ability
- Create your own character set
- Automatic recognition of single or double density and single or double sided
- All features available for either single or multiple drive systems
- Settable Disk Drive Seek Rates
- Faster High Resolution Video Display with 5 different formats
- Save RS Basic from RAM to Disk
- Move RS Basic to RAM
- Load and save function on FLEX disk
- 24 Support Commands 12 with Source Text
- External Terminal Program

DATA-COMP has everything you need to make your TRS-80C Color Computer WORK for YOU; from Parts and Pieces to Full Ready To Use Systems. DATA-COMP designs, sells, services, and SUPPORTS Computer SYSTEMS, not just Software. CALL DATA-COMP TODAY to make your Computer WORK FOR YOU!

System Requirements

FLEX9 Special General Version + Editor & Assembler (which normally sell for \$50.00 ea.)	\$150.00
F-MATE(RS) FLEX9 Conversion Rout. for the RS Disk Controller when purchased with Special General FLEX9 Sys.	\$ 49.95
when purchased without the General FLEX9 Sys.	\$ 59.95

Color Computer with 64K RAM and EXP. BASIC \$399.95

SPECIAL SYSTEM PACKAGES

64K Radio Shack COLOR COMPUTER, Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, Special General Version of FLEX9, F-MATE(RS), and a Box of 10 Double Density Diskettes, a COMPLETE ready to run SYSTEM on your Color TV Set. \$999.95

64K Radio Shack COLOR COMPUTER, Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, and a Box of 10 Double Density Diskettes, a COMPLETE ready to run SYSTEM on your Color TV Set. \$799.95

PARTS AND PIECES

Radio Shack Disk Controller	\$169.95
1 Single Sided, Double Density Disk Drive Tandon	\$229.95
1 Double Sided, Double Density Disk Drive Quine	\$319.95
1 Quine Thinline Double Sided, Double Density	\$249.95
1 Tandon 40 Track SSDD with Cabinet and Power Supply	\$259.95
Single Drive Cabinet with Power Supply	\$ 79.95
Double Drive Cabinet with Power Supply	\$109.95

DISK DRIVE PACKAGES, etc.

These Package include the Radio Shack Disk Controller, Disk Drives with Power Supply and Cabinet, and Disk Drive Cable:	
PAK #1 - 1 Single Sided, Double Density Sys.	\$389.95
PAK #2 - 2 Single Sided, Double Density Sys.	\$675.95
PAK #3 - 1 Double Sided, Double Density Sys.	\$569.95
PAK #4 - 2 Double Sided, Double Density Sys.	\$919.95
PAK #5 - 2 Quine Thinline Double Sided, Double Density Sys.	\$699.95
PAK #6 - 2 Tandon Thinline Single Sided, Double Density Sys.	\$599.95

PRINTERS

EPSON RX-80	\$375.00
EPSON MX-100	\$725.00
EPSON MX-80	\$395.00
EPSON FX-80	\$599.00

SERIAL BOARDS

MX-Series	\$119.95
RX-FX-Series	\$ 99.95
Spectrum MX-Series	\$ 54.95
Mark Data Keyboards	\$ 67.95

FLOPPY DISKETTES

MEMOREX	VERBATIM
5" Soft Sector Disks	
Single Sided Single Density	\$2.40ea. \$2.75ea
Single Sided Double Density	\$2.40ea. \$2.75ea
Double Sided Double Density	\$4.92ea
Plastic Storage Box	\$2.00ea
8" Soft Sector Disks	
Single Sided Single Density	\$3.75ea
Single Sided Double Density	\$4.16ea
Double Sided Double Density	\$4.75ea
Plastic Library Box	\$5.00ea

Single Drive Disk Cable for RS Controller	\$ 19.95
Double Drive Disk Cable for RS Controller	\$ 24.95
Micro Tech. Prods. Inc. LOWER CASE ROM Adapter	\$ 74.95
Radio Shack BASIC Version 1.1 ROM or 1.2 ROM	\$ 34.95
Radio Shack Extended Basic ROM	\$ 74.95
Radio Shack Disk Basic ROM 1.1	\$ 29.95
Screen Clean - Clears Up Video Distortion On Your Color Computer	\$ 39.95
Set of Eight 64K RAM Chips w Mod Instructions	\$ 49.95

For Ordering Call TOLL FREE 1-800-338-6800

LAST OF PRODUCTION!!!

!! LIMITED QUANTITY !!

SWTPC 8212

Intelligent Terminals

New & Demo Models

At Discount Prices

Remaining Supply of
SWTPC 8212 CRT Terminals

EM-82 Video Terminal

Emulates the 8200 Series from SWTPC



*FLEX is a trademark of Technical Systems Consultants
*OS9 is a trademark of Microware



Data-Comp—South East Media & 68 Micro Journal Are Divisions of CPI

Software

For Ordering Call TOLL FREE 1-800-338-6800
FLEX™ OS-9™ Color Computer



NT LISTS! A FULL BLOWN DISASSEMBLER FOR THE COLOR COMPUTER

Computer Systems Consultants SUPER LISTEN is a "Time Tested", reliable, PROVEN Disassembler that has gained acceptance through out the FLEX Community as an extremely POWERFUL, INTERACTIVE Software Tool. Now, this powerful Disassembler has been converted to run on a Standard 32 Color Computer or FLEX-OS9 System with a Disk System. The Disk System Software Package consists of 3 Programs: LISTEN (the Disassembler), CHASE (used to globally change labels to a meaningful name), and XREF (a Cross Reference Generator for Source Code Files). Coco LISTEN will disassemble Disk Files of sizes, 64K, 128K, 256K, 688K (the "Baby Coco"), 888K, 1688K, 2688K, and 3688K (Apple, Atari, Commodore, etc.) Object Code if you can get it on a Color Computer Disk. (See Aug. '83 '88 Micro Journal "Color Users Notes" Column for a full Review.)

Color Computer Disk - Object Code Only \$49.95

FORTRAN Programming Language
Bassett Electronics FORTRAN - Instructed by North77. Now is a FORTH package tailored to the Color Computer. This package is supplied on Tape, with instructions for transferring it to Disk if you wish. Written primarily in machine language, it's speed is unparalleled. A full Graphics-8 Editor is provided, along with "goodies" like Graphics and Sound Commands, Printer Commands, Auto-Repeat and Control Keys, etc. If you are interested in learning Fortran, a Trace Feature is provided which is invaluable. If you are a FORTRAN Pro, this package provides CPU carry flag accessibility, Fast Task Multiplexing, Clean Interrupt Handling, etc. (Or, you won't "out grow" the basic capabilities of this implementation). Consider this package with Leo Brodie's EXCELLENT Book "Starting FORTRAN", and you will be a FORTRAN Expert before you know it (test how a lot of fun doing it!).

Color Computer TAP (w/ instructions for transferring to disk) \$59.95

Color Computer GRAPHIC SOURCE EDITOR Program
Dumps any "PROFILER" Screen to the Printer with the BASIC USR Function. Shift the Printout Left or Right or Reverse Print (Dark for Light Screen and Vice Versa). All Programs on Tape.
DISP for Radio Shack LR-VII/VIII & IMP 180/280/480 Printers \$7.95
DISP for Epson V/ Graphics and Graftrax + Printers \$7.95
DISP for Gemini 10 and 15 Printers \$7.95
DISP for the Prowriter Printers \$7.95

DATA-O-BASE CALCDATE Program
A Menu Driven EXTENDED BASIC Program which allows the entry of up to 12 Names per Day, each of which may contain up to 28 characters, for any day of the Month between the years 1700 and 2099. A Graphic Calendar shows which days contain Names, and a "Key Word" Search is provided which can be output to the Screen or Printer.
DATA-O-BASE CALCDATE (Each Tape File will hold up to 480 Names) \$16.95
DATA-O-BASE CALCDATE (4.888 Review on 380/Month per Disk) \$19.95

Interested in INTEREST (the Money Kind)?
An EXTENDED BASIC Program that will help you deal with numerous problems requiring interest calculations. Present Value, Rate of Return, Current Bond Yield and Rate of Return to Maturity, Loan Repayment Amortization Schedules, etc.
INTEREST \$29.95

DATA BASE MANAGEMENT System
DISK DATA MANAGER 64K - EXTENDED BASIC w/ Mach. Lang. Routines. Allows a max of 240 chars. and 14 Fields per Record, and another Record can be linked to the first. 8 Char. Field Names, up to 99 Chars. per Field. Powerful On-Screen editor for input and update, flexible Output capabilities including output to Disk Files for use by other Programs. Change File Definition without re-entering the Data, Split Files, etc. Allows Multiple Field Sorts, Select on any combination of Fields, etc. An extremely POWERFUL TOOL! Instructions provide examples of Mailing Lists and a Financial Stock Profit and Loss Tracking System.
DATA MANAGER \$54.95

ACCOUNTING
DISK DOUBLE ENTRY - DISK EXTENDED BASIC w/ Mach. Lang. Routines. A "Traditional" Accounting Package for Small Business, Clubs, Churches, Personal Use, etc. Up to four levels of subtotals with Trial Balance, Income Statement, and Balance Sheet Reports. DISK allows up to 300 accounts and a Trial Balance of 39,999.99. Transactions may be up to 14 lines long, and comments and explanations may be freely used. Accounts are traceable to the journal transaction, which may include comments. Screen reports allow review of past transactions and current balances.
DOUBLE ENTRY \$44.95

SPREADSHEETS — A full, screen oriented, WORD PROCESSOR —
SPREADSHEET 2.0 — (now runs on the Data-Base and FLEX Color FLEX Systems uses the 32 x 24 Display Screens). Full screen display and editing (i.e., what you see is what you get) supports the Daisy Wheel proportional printers.
SPREADSHEET 2.0 — \$195.00 FLEX and OS-9 \$195.00 DISK \$195.00

Fast SPELLING CHECKER — allows directly changing the Text File, adding words to the dictionary, etc. 75,000 words in less than 400 sectors.
SPELLING CHECKER \$125.00 DISK \$125.00

MAIL MERGE — greatly extends the power and flexibility of SPREADSHEET. Allows Multiple Text files to be printed out as one large document. Provides for merging information into the Text File during printing (such as different names and addresses), etc.
MAIL MERGE \$145.00 DISK \$145.00

DISKDATA Data Base Management System — An X-BASIC-based, Menu Driven, DBMS with "Built-In" Audit Tracking, Extremely Powerful Report & Format Capabilities, etc. This Time Proven DBMS will become the "Work Horse" of your Software Stable.
FLEX and Color FLEX \$299.95 DISK \$299.95

Accts Rec'd, Accts Payable & G/L Ledger — A FULL Accounting Package that can be used together, or as separate packages provides the IRS required Audit Tracking. (X-BASIC, based on the "Osborne Business Programs.")
FLEX and Color FLEX \$299.95/PROG DISK \$299.95/PROG

AN ELECTRONIC SPREAD SHEET
DYNAMIC — THE Electronic Spread Sheet for 6502 Computer Systems. An extremely POWERFUL Business Tool, this Program will find an unlimited number of "non-business" applications, also (for example, I have just finished setting up a Full Junior College Electronics Curriculum using DYNAMIC). Advanced features like "Double Lookups" make DYNAMIC the work easy. Column or Row Sorting for numerous applications and completely "Variable Resizable", Machine Language, this Program is FLEX. Provides Standard Text File output for use with most Printers, Pascal, etc.
FLEX and SPECIAL Color FLEX (Each FLEX and Data-Base) \$299.95 DISK \$299.95

Machine Language DBR, BASIC MANAGEMENT System
Westchester Applied Business Systems X-BASIC Data Management Systems. Possibly one of the most powerful DB's available, this machine language program is small enough to fit on 8 single sided 5 1/4" disk, yet provides the speed of H.L. and power limited only by the user's imagination. Supports Sequential, Hierarchical, and Random Access File Structures, and has Virtual Memory capabilities for those Giant Data Bases. Easy-to-use English Language Command Structure.
X-BASIC — FLEX and Color FLEX \$199.95 X-BASIC — FLEX and Color FLEX \$299.95

UNIVERSAL DATA RESEARCH INC. — Notes ALL Accounting and DBR Progs. require FLEX and X-BASIC
These are Time Tested programs from an old, established, software house for Color FLEX Systems
Data Base Manager Part 1 - \$49.95 Data Base Manager Part 2 - \$49.95
Check Contributions - \$49.95 Single Entry G/L Ledger - \$49.95 Balanced Billing System - \$49.95

Interpreted Software for Color FLEX
A/C \$99.95 A/P \$99.95 G/L Ledger \$129.95 Inventory 2 \$299.95 Payroll \$99.95

FLEX and UniFLEX — Note: Requires X-BASIC or BASIC (UniFLEX)
A/C — FLEX \$295 UniFLEX \$395 A/P — FLEX \$295 UniFLEX \$395
G/L Ledger — FLEX \$295 UniFLEX \$395 Inventory 2 — FLEX \$295 UniFLEX \$395
Payroll — FLEX \$195 UniFLEX \$395
Please specify 5 or 8 inch disk when ordering all software.

FULL SCREEN POWER DISPLAY
Computer Systems Consultants FLEX X-BASIC Program
FLEX and Color FLEX \$199.95
FULL SCREEN MAILING LIST
FLEX and Color FLEX \$199.95
FULL SCREEN INVENTORY/PUR
FLEX and Color FLEX \$199.95
UNLICA DATA SPREADSHEET

SPELL88 "Computer Dictionary" — OVER 120,000 words.
No more "let your fingers do the walking through the Dictionary" while you are inputting Text with your favorite Editor or Word Processor. SPELL88 is more than "another Spelling Checker"; it allows you to look up a word from within your Editor or Word Processor so that you KNOW it is right WHEN YOU TYPE IT IN with the SPELL88 utility which operates in the FLEX Utility Space. Yes, it ALSO allows you to check and update the Text after you are finished, along with allowing you to add WORDS to the Dictionary. "Flag" questionable words in the Text for evaluation later. "View a word in context" before changing or ignoring, etc. SPELL88 first checks a "COMMON WORD Dictionary", then the normal Dictionary, then a "Personal Word List", and finally, any "Special Word List" you may have specified. SPELL88 also allows the use of Small Disk Storage Systems.

SPELL88 and Color FLEX \$199.95

JUST — a Text Formatter
JUST, a Text Formatter developed by Ron Anderson, provides numerous features which make it a valuable addition to any FLEX Users Software Library. JUST is designed for formatting Text Output for 300 Matrix Printers and provides many unique features:

-Output the "Formatted" Text to the Display for screen analysis and change.
-Output the "Formated" Text to a Text File for use with the supplied PRINTF.ODF for producing multiple copies of the Text on the Printer INCLUDING PRINTER COMMANDS (this Utility is very useful at other times also and worth the price of the program by itself).
-User Configurable! for adapting to other printers (comes set up for Space 80-80 with Drafts) provides for up to ten (10) embedded Printer Control Commands, such as Italic on and off, boldface on and off, etc.
-Automatic compensation for a "Double Width" printed line.
-Includes the normal line width, margin, indent, paragraph, space, vertical skip lines, page length, page numbering, centering, fill, justification, etc.
-One with ANY Editor.

-Supplied with "Structured Source" (Windows PC/91) easy to see the flow of the program.
FLEX and Color FLEX \$49.95

SPECIAL! SPECIAL! SPECIAL!
Star-Kit's excellent SPELL88 FIX Dictionary and WRITE 8 SMALL Word Look Up Program in ONE PACKAGE:
FLEX and Color FLEX System — BOTH FOR ONLY \$199.95
when these are gone, the price goes UP! MAY 1984. ORDER NOW!

Also, call for "More Info" on both the FLEX Based and Color Computer Based STAR-KIT Products including the HIGHLIGHT Monitor, Check "8 Tax Program, REPORTER Color Computer External Terminal Program, etc.

PRINC UTILITIES — Requires X-BASIC Pascal Ver. 3.

REFP — produce a Cross Reference Listing of any text oriented to Pascal Source.
INCLUDE — allows the inclusion of other files in a Source Text; has unlimited nesting capabilities. Also allows Binary File Inclusions.

PROFILER — produces an Indented, Numbered, "Structogram" of a Pascal Source Text File. Allows viewing the overall structure of large programs, and provides clues as to the integrity of the program. Supplied as Source Code; requires compilation.
FLEX and Color FLEX — Each program \$25.00

COPYCAT — (Pascal NOT required) Allows reading TSC Mini-FLEX, SSI COSS, and Digital Research CP/M Disk while operating under FLEX 1.0, FLEX 2.0, or FLEX 9.0 with 6808 or 6809 Systems. COPYCAT will not perform Miracles, but, between the program and the manual, you stand a good chance of accomplishing a transfer. Includes Utilities to list Directories, Copy Files, and convert Text Files when required. Also includes a Utility for investigating Physical compatibility problems. Programs supplied in Modular Source Code to make it easier to solve unusual problems.
FLEX and Color FLEX \$75.00 DISK \$65.00

Depend On South East Media Make Your 'BACK-UP' On South East Media

"FLEX is a trademark of Technical Systems Consultants
"OS9 is a trademark of Microware

Color Micro Journal

For Ordering Call TOLL FREE 1-800-338-6800
FLEX™ OS-9™ Color Computer

DISP — DISP to FLEX — FLEX to OS-9
Finally the barrier has been removed between OS-9 and FLEX formatted disk. Now you can READ from, and WRITE to, a Single Sided 5" or 8" FLEX diskette from OS-9 with 0-P. 0-P is a new and unique program, written in BASIC, that performs the following functions:
DISPINFO: A BASIC PROGRAM that reformats a chosen amount of an OS-9 disk to FLEX format so it can be used normally by FLEX.

PLX2: A BASIC Program that does the actual read or write function to the special 0-P Transfer Disk, all selectable from a user-friendly menu. Functions provided include reading the FLEX Directory, Deleting FLEX Files, Copying both directions, etc. All selections are interactive and complete, including all necessary prompts to the operator.

FLEX users can read, write and use the special disk as any other FLEX disk, provided the FLEX directory is not allowed to continue beyond track zero (no more files).

FLEX and Color FLEX \$79.95

COPYFILE.ODF — Copy LARGE Disk to several smaller disks —
The following FLEX utilities allow the backup of ANY size disk to any SMALLER size diskette (Winchester to 5's or 3's, 8" to 5's, etc.). By simply inserting diskettes as requested by COPYFILE, a large disk system may be duplicated to your present floppy disk system, any size. No need to fiddle with directory deletions or any of the other tedious operations that must be done using the normal copy routines.

COPYINFO.ODF — understands normal "copy" syntax and always keeps up with files already copied by maintaining directories for both host and receiving disk system, eliminating hours of tedious keyboard entries and other time consuming cleanup chores.

BACKUP.ODF — is a special program that downloads "random" type files, any size.
RESTORE.ODF — a special program to restructure copied "random" files for copying, or recovering back to the host system.
FILELINK.ODF & "Bonus" utility that "links" the free chain of floppy or hard disk thereby eliminating fragmentation.
Completely documented source files included. All 4 programs \$99.95 (5" or 3")

CHESSE.ODF — Requires FLEX and DISPLAYS on Any Type Terminal
Features:
* Two display boards. * Chess skill level. * Swap sides. * Point scoring system.
* Your levels of play. * Solve Checkmate problems in 1-2-3-4 moves.
* Make move and swap sides. * Play white or black.

This is one of the strongest CHESS programs running on any microcomputer, estimated CSCF Rating 1600 (better than most "Chess" players at higher levels).

FLEX and Color FLEX \$79.95

DIET-TRAC — DIET-TRAC Processor
DIET-TRAC Processor is an X-BASIC program that plans a diet in terms of either calories and percentage of carbohydrates, proteins and fats (C/P/G) or grams of Carbohydrate, Protein and Fat food exchanges of each of the six basic food groups (vegetable, bread, meat, skim milk, fruit and fat) for a specific individual.

Sex, Age, Height, Present Weight, Present Size, Activity level and Basal Metabolic Rate for normal individual are taken into account. Ideal weight and maintaining calories for any weight of the above individual are calculated. When a weight goal is given (either gain or loss), and a calorie plan is agreed upon between the computer and the individual, the number of days to reach the weight goal is projected. The starting and ending rate of weight loss is calculated, and a daily calendar with each day's weight for a 30-day period is printed.

FLEX — \$59.95 DISK — \$59.95

NETLINK — A COMMUNICATION Package for the UniFLEX operating System —
Allows UniFLEX Based Systems to Transmit and Receive files to and from other Computer Systems via Modem. Use with CP/M, Main Frames, other UniFLEX Systems, etc.
-- Verifies Transmission Integrity using checksum or CRC
-- Automatically Re-Transmits bad blocks
-- Transmits data in 128 byte blocks

FLEX and Color FLEX \$299.95

Super Sleuth — Powerful, INTERACTIVE, Disassembler provides Hex/ASCII Screen Dump of Memory Blocks or Disk Files for easy examine/Change, Area Definitions; X-REF Generator of Source Code; change Address Labels to Memory etc. Disassembles 6800/1/2/3/8/9 and 6802 Code.
Color FLEX Obj. Only \$58.95 w/source \$99.95 FLEX \$99.95 DISK \$89.95 OS-9 \$109.95

DISASSEMBLER + — An "easy to use" 6800 Disassembler for use w/ disk files. (will also disassemble 6802 Code). Develops a "Control File" of Area Definitions during successive disassemblies; X-Ref Source Files; replace hex locations with label names; etc. Label Files provided for UniFLEX, FLEX2, FLEX3, Color Computer FLEX.
FLEX and Color FLEX \$109.95

HALC — the FLEX Standard Assembler —
TSC Macro Assembler — the FLEX Standard Assembler. FLEX and Color FLEX \$159.95

BBMC — Relocating, Recursive-Macro Assembler and Linking Loader for the 6809. Use either standard Motorola Format or Special Ed Smith Format. Supports Recursive Macro, Conditional Assembly, etc. Opt. X-Ref Listings; includes a small line-oriented editor as part of the Assembler. Greatly improved operating manual.
FLEX and Color FLEX \$169.95 BBMC \$169.95

CompaSoft Relocatable Assembler and Linking Loader — 2-pass Reloc. 2-pass Link, Load. Supports 6 Char. Labels, System Calls (SVCs), PC/16, Expressions with Arith., Logic, and Shifts, etc.
FLEX and Color FLEX \$125.00 (one year Maint. \$159.95)

MACS — (by Charles Trotter) from WINGARD MICRO SYSTEMS. A combined Editor/Assembler designed to allow the Programmer to Enter, Edit, and Assemble Programs with a minimum of effort, w/o leaving the Program. MACS is a Cross Assembler for the MC6808/1/2/3 and Hitachi HD6381 (CMOS 6808) with the same functions and features as HALC.
FLEX and Color FLEX \$199.95

BBB — Re-creates a Source Listing from UniFLEX compiled BASIC Programs. Easy to Use works w/ All Versions of UniFLEX. Basic Output to Disk or Term. Disk Version and Source BASIC. DISK \$129.95

PLC — (by Charles Trotter) from WINGARD MICRO SYSTEMS. A "structured" Assembly Language Editor/Compiler/Debugger, all in ONE PACKAGE; provides a totally INTERACTIVE Program Development Cycle. The Compiler supports large Symbol Names, Variable Types, Pointers, Control Structures, Stack, Arith., etc. and Register manipulation, etc. The Source oriented Trace/Debugger provides Single Stepping, Breakpointing, etc. An excellent Software Development Tool for utilizing the power of the 6809.
FLEX and Color FLEX \$219.95

C — (by James McEachan) from WINGARD MICRO SYSTEMS. SUPER C Compiler for the FLEX Operating System. Needs the TSC Relocating Assembler/Linking Loader for these "full blown" System Packages.
FLEX and Color FLEX \$299.95

PLC — Native Code Compiler (OS9 Oriented).
Locate PLCM — P-Code Compiler (OS9 Standard). Designed especially for Microcomputer Systems. Runtime System checks available resources for each task, allowing operation on even minimal computer systems. Allows Linkage to Assembler Code for maximum flexibility.

OmegaSoft PARCS — For the PROFESSIONAL 162-Based, Native Code Compiler. For Real-Time and Process Control applications. Use custom I/O devices in place of the usual INPUT and OUTPUT Long Int. (12 bit); dynamic length strings; Interrupt Processing, ROMable, PIC, Re-entrant code, etc. PARCS includes Source for the symbolic Debugger, Runtime, and several UTILITIES. Requires a "Motorola Compatible" Relocating Assembler and Linking Loader.
FLEX2 FLEX and Color FLEX \$425.00 (one year Maint. \$500.00)

DISKWARE — Multi-User, Multi-Tasking With FLEX
Southwest Media is now shipping DISKWARE PRO STOCK — the multi-user, multi-tasking capability of DISKWARE allows FLEX users the advantages of more sophisticated and time saving computer usage without having to buy or learn a new language or operating system syntax. DISKWARE, as its name implies, allows the "time-sharing" operation under the popular FLEX operating system, and also allows each user to run two simultaneous jobs (multi-tasking) even on single-user systems. For example, while in EDIT, you can list another file or execute a directory. Or, you might look up an item in a Data Base, while a sort is in progress. DISKWARE also

contents, provides listing controls such as a pause when the Screen is full, etc. It also provides much more flexible Commands; for example, if you enter **CAT .TXT** it will display a Disk Catalog of the Files with a ".TXT" Extension ONLY, or if you enter **COPY 0 1 .TXT** it will copy ALL of the Files from the Disk in Drive 0 to Drive 1 that have a ".TXT" Extension, etc. Like the Radio Shack Operating System, **FLEX** is strictly a Single User Operating System.

The **OS-9 Operating System**, on the other hand, has Multi-User (several Users can use the same Computer at the same time) and Multi-Tasking (more than one Program can be run at the same time) capabilities. **OS-9** and the **6809 Computer Chip** provide the most powerful 8-bit Computer Operating System available anywhere. We noted that the Radio Shack Operating System was ROM Based, and that **FLEX** was Disk Based; the **OS-9 Operating System**, in general, can be EITHER (or even Tape Based, for that matter, but the use of the Microcomputer Tape Systems would severely restrict its capabilities). Where the **RS** and **FLEX** Operating Systems are fixed in memory, **OS-9** can live ANYWHERE. Where the **RS** and **FLEX** Operating Systems are effectively each a single program, **OS-9** is made up of several **MODULES**; portions of programs that are linked together. It can be used with a few modules (for example, in a Traffic Light Controller), or with numerous modules (for example, as is used in the **GIMIX III Computer System** with "smart" I/O Ports, Dynamic Address Translation for use with up to a Meg of Memory, 5", 8", and Hard Disks, Serial and Parallel Printers, numerous Terminals, etc., all in the same System). But, with this Power and

Flexibility, it is actually an EASY Operating System to learn and use.

The **OS-9 System** that is available from Radio Shack for the Color Computer is the **OS-9 Level I Disk Operating System**. While Level I **OS-9** will support Multi-User operation, it is somewhat restricted due to lack of Memory (it can only use 64K); and the limitations of the Color Computer (after all, you do not have a \$5,000 Computer System) make the Multi-User capability even more restrictive. There are actually two limitations in the Color Computer; the use of PIA's and Software to obtain Serial Data Transfer, and the requirement that the Interrupts must be disabled during Disk Operations. The Software driven Serial port will make it very difficult to allow a Terminal, for use by a second User, to talk back and forth with **OS-9** when connected to the Serial port of the Color Computer (but a Printer works FINE); the only problems that shutting off the Interrupts during Disk accesses cause is that the "Clock" is shut off during that time, so will run a little slow, and you lose the Keyboard when a Disk is being accessed (which makes it a little hard to run a Printer Listing of a Disk File as a "background task" while you are using an Editor or Word Processor). Other than these two minor problems, I can see very little difference between the operation of **OS-9** on the Color Computer or on the larger **SS-50 Bus Systems**. The more you use **OS-9**, the more you will grow to love it.

pattern indicated a problem detected by the test program. This technique may be used with the older **COCO's**, but the newer ones have significantly less RFI, and is not as effective.

Soon afterward, an article appeared in **BYTE Magazine** describing a simple circuit which allowed an oscilloscope to be used to monitor address bus activity. The high-order eight bits of the address bus are connected to a digital to analog converter, and the low-order eight bits are connected to another digital to analog converter. One converter is connected to the horizontal input of the oscilloscope, and the other is connected to the vertical input, providing an X-Y display of the activity. The display shows address bus activity (or lack thereof) dramatically. Unfortunately, the display changes so rapidly that it is very difficult to see patterns in the addresses. It is also not possible to relate the display directly to addresses. Also, this method requires the use of an oscilloscope, which is more costly and usually more bulky than the **COCO** itself.

Another approach often used on older computers of all sizes is to simply provide a LED display for all address lines and/or data lines on the bus. This method also shows bus activity, and has the additional advantages of being cheaper and more portable than the oscilloscope method. It has the disadvantage of providing a display which is often changing so fast that it is not possible to see patterns in it.

To provide a display better suited to pattern recognition, I built the circuit below, which uses a TTL chip (**74LS154**) providing a one of sixteen output for any combination of four inputs. The four input lines are attached to the four high-order address lines. After this display is attached to the computer, the user will quickly begin to recognize normal and abnormal patterns. Since the sixteen LED's display the leading hex digit on the address lines, the changes among the lights will be vastly slower than in the one-to-one case. A seven-segment hex display would not work, since it will usually read '8', because the addresses normally change too fast to detect with the eye.

Actually installing this circuit into a **COCO** is reasonably simple. Individual LED's are usable, as are bar-graph LED's (available at Radio Shack), as long as they are of the separate anode and cathode or the common anode varieties. Because the loading factors are small, the circuit could be wire-wrapped on a small section of perf-board and point-to-point wired for power, ground, and address lines. The power, ground, and address lines could be picked up by tacking SHORT wire-wrap lines directly to the appropriate pins on the **6884** or on the **6809**.

The LED's or bar-graph units may be readily mounted on the cover just above the keyboard by boring holes in the plastic, and then filing away the plastic, as necessary for the bar-graphs. The LED's should be labelled 0-9 and A-F in sequence from left to right. Press-on letters are available from many bookstores for a professional look. Since the bar-graphs come with ten LED's each, the extra four lines could be used as power indicators or could be buffered and used to indicate

Continued next Month

WHERE IS THE COMPUTER NOW ? ?

Where, Oh Where, Has My **COCO** Gone?

or

Somewhere Over The Rainbow

or

Lost In Space

or

The Black Hole

When working with computers, such as the **TRS-80 Color Computer**, without front-panel displays, it is often very difficult to know what the computer is doing. There are no blinking lights to indicate activity on the address and data busses. Without some assistance, it is often impossible to determine whether the **COCO** is not operational or is simply in some long internal computational or table-searching sequence.

My first encounter with the problem occurred several years ago while running extensive memory tests on a computer with elusive problems. I did not want to sit at the terminal staring at the screen for hours waiting for the memory test to output diagnostic messages. I placed an AM radio tuned to one of the RFI emission bands on the top of the computer while it was being tested. Since the memory test was so repetitive, it sounded like a metronome. Any break in the audible

GRAND SLAM BRIDGE

SHARPEN UP YOUR BRIDGE GAME. COMPUTER BIDS YOUR PARTNER'S HAND AND PLAYS THE OPPONENT'S HANDS. RANDOM HANDS DEALT EACH TIME. CARDS, TRICKS, BIDS, AND CONTRACT SHOWN ON SCREEN.

32K

CASSETTE \$19.95

STOCK OPTION STRATEGIES

DEVIDE YOUR OWN STOCK OPTION STRATEGIES. COVERED OPTIONS, STRADDLES, CALLS, AND PUTS. % GAINS AND LOSSES VS. FUTURE STOCK PRICES GRAPHED IN COLOR. EASY TO USE, NO DATA BASE REQUIRED, JUST ENTER FROM KEYBOARD. MENU DRIVEN.

16K

CASSETTE \$14.95

SEND CHECK OR MONEY ORDER TO:



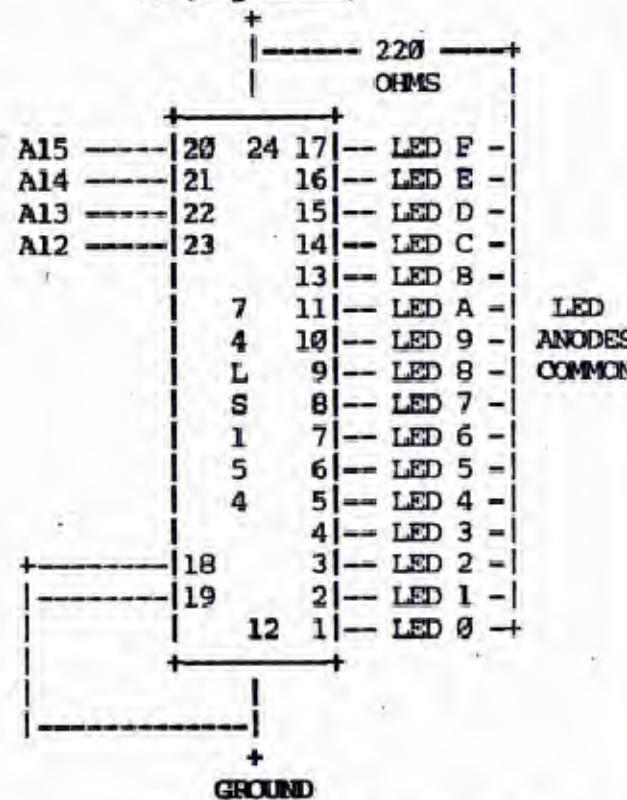
GREENTREE SOFTWARE
P.O. BOX 97
GREENWOOD, IN 46142



other bus line logic levels.

A useful additional application of the display is as a debugging tool. Temporarily attaching a diode from one of the output pins on the 74LS154 to the NMI pin on the 6809 will generate an interrupt whenever any address in that range is generated. Of course, the user must provide an interrupt-handling routine and place its address into the SAM NMI vector register for this technique to work.

+5 (regulated)



by E. M. (Bud) Pass, Ph.D.
Computer Systems Consultants, Inc.
1454 Latta Lane, Conyers GA 30027
Telephone Number 404-483-1717/4570

**SUPPORT
YOUR
ADVERTISERS**

BASLIST/BAS

As now written, this program allows user selection of the LEFT MARGIN, and will automatically indent the wrap around portion of a line properly, for line numbers of up to 5 digits. Also the number of wrap around lines is unlimited, depending only on the length of a line permitted by BASIC. It does come into play, however, for large left margins. The Margin may be changed to suit by altering 'X' in line 560.

I am using an OKIDATA 83A printer. CHR\$(30) prints the normal 10 C.P.I. while CHR\$(29); CHR\$(31) prints Bold Type.

SEPTEMBER 23 1983
JOHN H. DEAN

SEPTEMBER 23
JOHN H. DEAN

TRS-80 COLOR COMPUTER
DISK NO. 1000

RS-80 COLOR COMPUTER
DISPLAY NO. 10000

BASL 1ST/BAS
PAGE 10

PAGE NO. 1

```

100 POKE 149,0:POKE 150,41:REM .. SETS 1200 BAUD
110 REM .. THIS PROGRAM CALLED ' B A S I S T ' AND LISTS A BASIC
PROGRAM SAVED IN ASCII CODE. IT WILL ALLOW SETTING A LEFT MARGIN, AND
WILL INDENT THE WRAP AROUND PORTION OF A LINE 1 SPACE PLUS THE NUMBER OF
DIGITS IN THE LINE NUMBER.
120 REM ***** ***** *****
130 REM .. THE PROGRAM TO BE LISTED MUST HAVE BEEN SAVED USING THE 'A'
FORMAT.
140 CLEAR 1000:CLS
150 INPUT"WHAT IS THE NAME OF THE BASIC PROGRAM. AS (BASLIST)";NS:PRINT
160 INPUT"ENTER TODAYS DATE. AS (SEPTEMBER 18 1983)";DS:PRINT
170 INPUT"WHAT IS THE DISK NUMBER. AS (1000)";D:PRINT
180 INPUT"WHAT LEFT MARGIN. AS (4)";X
190 K$=NS:NS=NS+{/BAS":PRINT
200 C=0:P=1:GOSUB 320:PRINT
210 OPEN "I",#1,NS
220 IF EOF(1)=-1 THEN 300
230 LINE INPUT #1,L$  

240 FOR N=2 TO 6:IF MIDS(L$,N,1)0" " THEN NEXT N
250 L1=N
260 IF LEN(L$) (80-X) THEN GOSUB 400:GOTO 280
270 PRINT #2,TAB(X);L$  

280 C=C+1:IF C=58 THEN PRINT #2,CHR$(12):P=P+1:C=0:IF EOF(1)0"-1 THEN
GOSUB 320 ELSE 300
290 GOTO 220
300 CLOSE #1:END
310 REM ***** ***** *****
320 REM .. SUBROUTINE TO PRINT HEADING AND SET BOLD PRINT.
330 CLS
340 PRINT #2,TAB(X);DS;TAB(32-X);"TRS-80 COLOR COMPUTER";CHR$(29);
CHR$(31);
350 PRINT #2,TAB(60-X);KS;CHR$(30);{/BAS"
360 PRINT #2,TAB(X);"JOHN H. DEAL";TAB(36-X);"DISK NO.
";D;TAB(63-X);"PAGE NO. ";P
370 PRINT #2:PRINT #2:IF P1 THEN PRINT #2
380 C=0:RETURN
390 REM ***** ***** *****
400 REM .. SUBROUTINE TO INDENT A WRAP AROUND LINE.
410 GOSUB 490
420 PRINT #2,TAB(X);L1$:C=C+1
430 L2$=RIGHTS(L$, (LEN(L$)-LEN(L1$)))
440 IF LEN(L2$) (80-X) THEN L$=L2$:GOSUB 490:GOTO 460
450 IF LEN(L2$) (-80-X) THEN 470
460 PRINT #2,TAB(L1$+X);L1$:C=C+1:GOTO 430
470 PRINT #2,TAB(L1$+X);L2$:C=C+1
480 RETURN
490 FOR J=1 TO 20
500 L1$=LEFTS(L$, ((80-X)-J))
510 IF RIGHTS(L1$,1)0" " THEN 520 ELSE 530
520 NEXT J
530 RETURN

```

by
John H. Deal

XDMS

Data Management System

The XDMS Data Management System is available in three levels. Each level includes the XDMS nucleus, VMGEN utility and System Documentation for level III. XDMS is one of the most powerful systems available for 6809 computers and may be used for a wide variety of applications. XDMS users are registered in our database to permit distribution of product announcements and validation of user upgrades and maintenance requests.

XDMS Level I

XDMS Level I consists of DEFINE, UPDATE and REPORT facilities. This level is intended as an "entry level" system, and permits entry and reporting of data on a "tabular" basis. XDMS Level I \$129.95

XDMS Level II

EDMS LEVEL III

Level III includes all of Level II plus a set of user or XDMS utilities. These utilities are designed to aid in the development and maintenance of user applications and permit modification of XDMS system parameters, input and output of XDMS files, etc. XDMS Level III \$269.95
XDMS System Documentation only (\$10. credit toward purchase). . . \$ 24.95

WESTCHESTER Applied Business Systems
Post Office Box 187, Briarcliff Manor, N.Y. 10510

All software is written in Macro/assembler and requires 6809 FLEX DOS. CoCo users will need F-MATE or FHL FLEX, 64K RAM and 1-2 disk drives. Terms: Check, Money Order, Mastercharge or Visa. Shipment First Class. Add P&H \$2.50 (\$7.50 Foreign). State Res add sales tax. Specify 5 or 8". Sales: South East Media 1-800-338-6800 Consultation: 914-941-3552 eves. FLEX is a trademark of Technical Systems Consultants, Inc.

REVIEW

RDC-1 DISK CONTROLLER

F & D Associates RDC-1
1210 Todd Road
New Plymouth, OH 45654
(614) 592-5721

The F & D RDC-1 Disk Controller Board for the Color Computer is an EXCELLENT example of "later technology" over the Radio Shack Disk Controller. One of the weak points in the RS Disk Controller is the omission of a precision Data Separator (evidently to hold the price down); see "Why CoCo can't Read", CMJ, Sept. '83. The other problem that has been persistent with the RS Disk Controller is the intermittent operation after the Controller has been in use a while, which is caused by corrosion due to the dissimilar metals in the ROM Slot Connector and the PC Board Edge Connector. The RDC-1G eliminates BOTH of the problems, and with a much LOWER parts count. It also provides flexibility in providing jumpers for the use of other Controller Chips, such as the 1797, and/or ROMs, such as the F & D FADBUG-C.

The RDC-1 is NOT available from F & D as a complete unit, or even as a complete PARTS KIT. The RDC-1 includes the bare PC Board, documentation, and a 9216B Data Separator Chip for \$49.95; while the RDC-1G is the same thing with Gold Plating on the PC Board Edge Connector for \$54.50. They also have available the Radio Shack Disk Basic ROM for \$35.00, a case for the Controller for \$7.50, the FADBUG-C Monitor for this Controller for \$25.00, and a 1793 Disk Controller Chip for \$32.00.

The packages and documentation are oriented towards the advanced hobbyist or industrial user who would normally have a lot of the required parts laying around, and would have no problem with the Documentation (which is oriented towards those with electronics experience). You should end up with LESS than \$150 in the whole Controller, even if you purchase everything including Sockets.

Once the parts are rounded up, it will take less than a couple of hours to assemble the Controller, and since there are no adjustments, it SHOULD work the first try (ours did). While there is plenty of room on the Board so that the work is not at all tedious, this DOES assume some experience in Digital Electronics Assembly and Soldering Techniques.

Our RDC-1 worked with no problems until we tried formatting a disk under CoCo OS-9; it would write all of the Tracks, but the Drive would not return to Track 0 to Verify the Format. Investigation by F & D revealed that the problem was in the standard WD1793 Controller Chip that we used; the SOLUTION was to use the Radio Shack version of the 1793, which is not made by Western Digital. (As a side comment, the only problem WE have had with the CoCo OS-9 has been in formatting a disk, and we have tried NUMEROUS Disks, Drives, and Controllers. It just acts like the

overall timing is cutting things TOO close. Once you get a disk formatted, everything works like a champ.)

The RDC-1 makes use of the new SMC9216B Data Separator Chip, which eliminates all adjustments and is less expensive than the popular chip sets normally used. The Board is the same size as the Radio Shack unit, and, with the Radio Shack Disk Basic ROM installed, is TOTALLY compatible with the normal Radio Shack Disk Systems. Installation of the FADBUG-C ROM will allow the FLEX Disk Operating System to be run WITHOUT RS Extended BASIC or Disk BASIC. Also, jumpers are provided for the installation of 28 pin EPROMs, allowing the use of 2716 through 27128 chips (2K thru 16K EPROMs). Jumpers are also provided for determining the Side Select connector pin number, the installation of a 1797 Chip, applying the Color Computer "CART" Line to pin 18 or 20 of the ROM, to connect the Cartridge Slot pins 7 and 8 together to enable the "automatic takeover" when a Cartridge is installed, etc.

The following parts list for the RDC-1 is provided so that you can begin rounding up the parts, estimating cost, etc.

INTEGRATED CIRCUITS

1 74LS163 Counter
1 74LS74 Dual-D Flipflop
1 74LS195 Counter
2 74LS06 Open Col. Drivers
1 74LS00 Quad NAND Gate
2 74LS04 Hex Inverters
1 74LS174 Hex D Latch
1 74LS02 Quad NOR Gate
1 74LS32 Quad OR Gate
1 SMC FDC9216B Data Separator
(Supplied w/ RDC-1)
1 1793 or 1797 FDC Chip
(1793 required for CoCo)
1 ROM or EPROM
(use RS Disk Basic for CoCo)

RESISTORS

4 150 ohm 1/4 watt 5%
2 1000 ohm 1/4 watt 5%
3 4700 ohm 1/4 watt 5%
3 10K ohm 1/4 watt 5%

CAPACITORS

1 4.7 mfd 15vdc Tantalum
7 .1 mfd 12v Disc
1 100 pf Disc

MISC. PARTS

1 PC Board
(Supplied w/ RDC-1)
1 8 Mhz Crystal
(optional items)
1 Dual Row Header for jumpers
? "Mini Jump" programming plugs
(like those used in the CoCo)
1 plastic Controller Case
1 8 pin socket
8 14 pin sockets
3 16 pin sockets
1 24 or 28 pin socket (for ROM)
1 40 pin socket

The F & D Associates RDC-1 is an EXCELLENT Disk Controller option for the Radio Shack Color Computer, providing RELIABLE Operation with a low parts count and NO adjustments (which means that as long as the Crystal is in tolerance, it should work with no problem). While it DOES require a little Electronics experience to assemble, it is NOT out of reach of most "hardware hackers" (if you don't have the experience, you probably have

COMPILER EVALUATION SERVICES

The S.E. MEDIA Division of Computer Publishing Inc., is offering the following 'SUBSCRIBER SERVICE':

COMPILER COMPARISON AND EVALUATION REPORT

Due to the constant and rapid updating and enhancement of numerous compilers, and the different utility, appeal, speed, level of communication, memory usage, etc., of different compilers, the following services are now being offered with periodic updates.

This service, with updates, will allow you who are wary or confused by the various claims of compiler vendors, an opportunity to review comparisons, comments, benchmarks, etc., concerning the many different compilers on the market, for the 6809 microcomputer. Thus the savings could far offset the small cost of this service.

Many have purchased compilers and then discovered that the particular compiler purchased either is not the most efficient for their purposes or does not contain features necessary for their application. Thus the added expense of purchasing additional compiler(s) or not being able to fully utilize the advantages of high level language compilers becomes too expensive.

The following COMPILERS are reviewed initially, more will be reviewed, compared and benchmarked as they become available to the author:

PASCAL "C" GSPL WHIMISCAL PL/9

Initial Subscription - \$39.95
(includes 1 year updates)
Updates for 1 year - \$14.50

S.E. MEDIA - CPI
5900 Cassandra Smith, POB 794
Hixson, TN 37343
615 842-4601

a friend that CAN assemble it); and the price is unbeatable!

PS

For those that are not regular '88' Micro Journal readers, F & D Associates has been producing Disk Controllers and Accessories for the SS-50 Bus Computer Systems for a few years, so are not "new to the business". They will be there if you have a problem.

CMV STAFF

OOPS!!

MICROBOOKS CLARIFICATION

In the discussion of the trial and error setting the of DIM and CLEAR Statements in the discussion of the MICROBOOKS Program in the Nov. '83 Issue of Color Micro Journal, I stated that I averaged about 20 Bytes per entry in my use of the Program, and that 25 Bytes would be a useable size to set in this method. Somehow, the word "useable" got PRINTED as "UNuseable". Obviously, there is a small difference in the two words.

No entry size is unuseable if you balance the DIM size to the CLEAR size. In rough figures, the DIM size times the expected entry size should equal the CLEAR size. If the number of Bytes per entry turns out to be greater, the DIM size will necessarily need to be smaller.

Continuing the discussion, the article suggests that after adjusting DIM and CLEAR sizes, if you do not get an "OM ERROR", you should use "PRINTMEM" to see if you still have enough memory left over to put to use (in the DIM and CLEAR Statements). This would be the case if the sizes were too SMALL. Somehow, it came out talking about putting the program to use, NOT the left over memory.

Jim Lalone

Thanks, Jim, for the clarification. In going over his ORIGINAL Manuscript, we note that the "un" was NOT in front of the "useable"; STUPID COMPUTER! In other words, WE blew it, not Jim. This is why we request, WHENEVER POSSIBLE, that the discussion supporting a Program be in SOME kind of an ASCII Format, such as Radio Shack /DAT File, FLEX .TXT File, or OS-9 Format. That way, we can transfer it DIRECTLY to the Word Processor, eliminating these kinds of problems. A BASIC Program is "no sweat", because we can save it in ASCII Format, ",A", and then transfer it directly, so any RS BASIC Programs are "pure", but the discussions with them give us some trouble. The "FINAL TEST" in the submission Format is "Can you read the Article with a "LINEINPUT A\$" Statement and Print it back out to the Screen or Printer with a "PRINT A\$" "; if so, we can handle it on this end.

Sorry for the slip-up.

RIN, Editor

X-Y PLOTS with the MX80 in Basic09

Are you a business analyst, engineer, scientist, or a student of statistics? If so, this Basic09 GRAF Procedure could just possibly save you a lot of work! In the past there has been many a time when I wished for an easier way to plot regression analysis equations. Prior to writing the GRAF procedure, the plotting of equations was a luxury that I often passed up due to the number of calculations required for a chart of respectable resolution. Now, I can generate a chart in less than two minutes. Take for example the chart in Example 1. This chart has as its X Axis numbers that represents my home gas bills, by month, over two years. With this chart I can visualize when and how much natural gas we use at my house.

The "GRAF Procedure" is written in the BASIC09 language from Microware. BASIC09 is a very powerful and relatively easy to use language which operates under the OS-9 Operating

System (also by Microware), which adds considerable power the language. However, with the right motivation and skill, one could convert this procedure to run under almost any BASIC or PASCAL language.

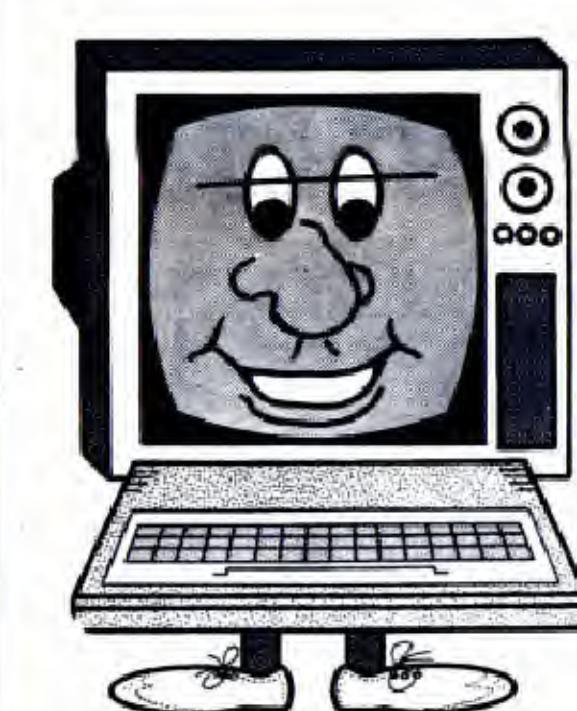
The graphic output is generated on a Epson MX80 Printer with the GRAFTRAX 09 ROMs installed. This printer, I also found, was easy to control.

The code, as presented here, operates as a subroutine. However, it could easily be modified to operate as a main procedure where the parameters are requested via the CRT.

The formulas that GRAF can plot are:

1. First degree linear equations of the form $Y = a + bx$
2. Second degree curvilinear equations of the form $Y = a + bx + cx^2$
3. Geometric equations of the form $Y = ab^{cx}$

In addition to plotting the line based upon the equation selected, this procedure will also plot up to 50 discrete points. This feature was added so that I could plot a selected regression formula along with the sample points that were used to



QUESTION
WHEN WAS THE
LAST TIME YOU
HAD A TALK
WITH YOUR
COCO



THE SPECTRUM VOICE PAK - a CoCo voice synthesizer - is a complete phoneme based voice system that uses the famous VOTRAX SC01 chip synthesizer in a cartridge style pak. It provides an unlimited vocabulary with automatic or user supplied inflection, plus four programmable levels of pitch. With a single line of code, THE VOICE PAK adds speech to any BASIC program in minutes. The system comes complete with user instructions, software cassette with 16K and 32K - DISK/TAPE versions, a text to speech scanner translator and a Word Manager that constructs and edits custom user dictionaries. The unit is fully assembled, tested and ready to plug in and talk, talk, talk. \$69.95

ALL ORDERS PLUS \$3.00 S/H - NY RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS / 93-15 86th DR / WOODHAVEN NY 11421 / 212-441-2807

establish the formula. With this feature I could visualize the "goodness of fit" of the equation.

The range that the plot extends along both the X and Y axes is set via an input parameter. This scale parameter is used to establish the sizes of the X and Y axes scale divisions. There are always six X axis divisions and five Y axis divisions. The absolute size of these divisions does not change. It is only the scale represented by these divisions that is modified for each chart.

When constructing a chart by the manual method, you would normally draw the X and Y axes along with their respective scales. Then you would plot a number of points per the selected equation. Finally, you label the chart. This approach cannot be used with most microcomputers for two reasons. First, most printers cannot feed the paper in two directions. Thus, multiple passes are impossible. Second, to generate the entire chart in RAM memory and then dump to the printer requires a minimum of 6K bytes just for the body of the chart. In addition, the code to access this 6K byte array would be fairly complex since it would need to address each bit individually.

The MX80 printer generates characters that use a nine by five dot matrix. The bottom row of dots is only used for descenders and block graphics. These characters are printed on lines with a vertical spacing of twelve dots. Thus,

there are three dots between each line of characters as a minimum. The MX80 BIT IMAGE GRAPHICS Modes can only address the top eight wires in its nine wire print head, limiting the number of rows that can be printed in one 'line' to eight. Strictly speaking, this is not a hardware limitation, but a limitation imposed by the size of a byte. The chart body generation can then only be accomplished eight rows at a time. As an alternative approach, you could have the body of the graph generated by using only one wire in the print head. By doing so you would then need to generate eight times as many 'lines'. Also, you would need to generate your own character set, since the MX80 could no longer print the Y axis scale. Since we want to print the Y axis scale as well as the body of the chart in one pass, we need to make the line spacing equal to eight dots plus limit the printing of characters for the Y axis to upper case only. This last limitation is really of no consequence since the data used in the Y axis scale is all numeric.

There are two basic BIT IMAGE GRAPHICS modes available in the MX80 with CRAFTTRAX-80. One of these modes provides 480 dots per line and the other provides 960 dots per line. The 480 dots per line mode is the one I have chosen since it provides more than enough resolution for generating charts. Also, this mode puts less of a burden on the communications port to the printer. When using the BIT IMAGE GRAPHICS modes the following table is used.

PRINT HEAD DOT PATTERN	VALUE	POWER OF 2
0 (TOP)	128	7
0	64	6
0	32	5
0	16	4
0	8	3
0	4	2
0	2	1
0	1	0
0 (BOTTOM)	N/A	N/A

For instance, the top dot is activated by sending the value of 128 to the printer, or the lowest addressable dot by sending a 1. These values can be summed. Thus, a value of 255 will activate all eight of the addressable dots in the print head. You will notice that the value associated with each addressable dot is a power of two.

The approach that I have found to work well considering printer capabilities, memory size, and program complexity was to generate the points for one line at a time. Each line actually consists of 1920 dots. These 1920 dots are made up of 8 rows of 240 columns each row.

After handling the normal house keeping chores of setting up the entry point, defining variables, and opening the printer path, the procedure begins by establishing the X and Y scale factors. Although setting the scale factors is easy, you must not ignore accuracy considerations. The physical chart is always 240 by 200 dots regardless of the scale. The trick in scaling is to modify the scaling factor such that the X scale is modulo 240 and the Y scale is modulo 200. I found it necessary to first fix the scale division size, and then the division size could be compensated for by the scale factor. By using this method, you often end up with either or both the X and Y axis lengths being smaller than requested. Increasing the requested X and Y axis sizes by 10% will usually give acceptable results.

The next significant step is to generate and print the chart body. There are several factors to consider here. First, the printer cannot feed paper backwards. Thus, you must print the entire chart in one pass from top to bottom. Second, the generation and printing must be accomplished eight rows at a time for each of the 240 columns in the body of the chart. This is required so that a Y scale can be printed using the MX80 upper case character set.

There is one additional characteristic of the GRAF Procedure that you must consider. After returning from the procedure, the Top-Of-Forms command will not generate the expected results. This is due to the use of a line height of eight dots instead of the standard 12 dots. The end result is that the MX80 line position is 112 vertical dots less than expected. This amounts to a little over nine lines that need to be compensated for by the calling routine.

I have included examples of FIRST DEGREE and EXPONENTIAL GRAF plots in Examples II and III respectively. The GAS CO. plot is an example of a second degree equation.

Color Micro Journal



TRS-80+ MOD I, III, COCO, TI99/4a
TIMEX 1000, OSBORNE, others

GOLD PLUG - 80

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors.

GOLD PLUG 80 solders to the board edge connector. Use your existing cables. (if gold plated)

GOLD PLUG 80 Mod I (6)	SPECIAL PRICES	\$44.95	\$54.95
Keyboard/EI (mod I)		15.95	18.95
Individual connectors		7.95	9.95
COCO Disk Module (2)		16.95	18.95
Ground tab extensions		INCL	1.00
Disk Drives (all R.S.)		7.95	9.95
Gold Disk Cable 2 Drive			29.95
Four Drive Cable			39.95
GOLD PLUG 80 Mod III (6)	COCO MODULE INSTALLATION AVAILABLE		54.95
Internal 2 Drive Cable			29.95
Mod III Expansion port			10.95
USA shipping \$1.45			Can/Mex \$4.
Foreign \$7			TEXAS 5% TAX

Ask your favorite dealer or order direct

E.A.P. CO.

P.O. BOX 14

VISA

ORDER TODAY!

KELLER, TEXAS 76248

(817) 498-4242

+ trademark Tandy Corp

MC/VISA

LOWEST PRICES!!

free shipping

complimentary gift

New Disk Drives

AS LOW AS \$159.00

Plus 6 Month Warranty

Even more savings!!

ALL DRIVES FULLY TESTED&WARRANTED

Complete Disk Drive with PS&Case	\$195.00
Two Drives in Dual Case & PS	\$359.00
1/2 hts double sided double density Disk Drives	\$239.95
1/2 hts double sided double density Disk Drives with ps&case.....	\$289.95
Single ps&case.....	\$44.95
Dual ps&case.....	\$74.95

Color Computer Controller

Supports double sided double density drives
with 1 year warranty and manual. \$139.95

Ask about our 3way Color Computer Drive Kits

Complete with Diskettes	starting at \$349.95
Diskettes	starting at \$19.95
Head Cleaner Kits	\$Call
Unadvertised Specials	\$Call
Drives cleaned, aligned & tested.....	\$29.95

TECHNICAL STAFF ON DUTY, PLEASE CALL FOR ASSISTANCE.

CALL US TODAY!!

(617)234-7047

*DEALER INQUIRIES INVITED.



TRUE DATA PRODUCTS

195 Linwood Street, P.O. Box 546

Linwood, Massachusetts 01525

(617) 234-7047

HOURS MON-SAT 9-6 (EST)

We welcome

- Visa /Master Charge
- Checks (allow 2 weeks for clearing)
- C.O.D. Add \$2.00


```

0379 (* GENERATE X AXIS TAB POINTS *)
0399
039A PRINT #PRINTER_PATH, TAB(20); CHR$(27); "K";
039B PUT #PRINTER_PATH, SCALE_TAB;
039C PRINT #PRINTER_PATH, CHR$(0);
039D PRINT #PRINTER_PATH, CHR$(0); CHR$(0); CHR$(0);
039E FOR N:=1 TO 6
039F   FOR I:=1 TO 39
0400     PRINT #PRINTER_PATH, CHR$(0);
0401   NEXT I
0402   PUT #PRINTER_PATH, MAX_LINE
0403 NEXT N
0404 PRINT #PRINTER_PATH
0405 PRINT #PRINTER_PATH, TAB(21);
0406 FOR N:=1 TO 6
0407   PRINT #PRINTER_PATH USING "#1,15-", X_SCALE(N);
0408 NEXT N
0409 PRINT #PRINTER_PATH, CHR$(27); "Z"
0410 PRINT #PRINTER_PATH \ PRINT #PRINTER_PATH
0411 CLOSE #PRINTER_PATH
0412
0413 END
0414
0415 (* GENERATE Y AXIS TAB POINTS *)
0416
0417 PRINT #PRINTER_PATH, TAB(19); CHR$(27); "K"; CHR$(3); CHR$(0)
0418   ;
0419 FOR K:=1 TO 5
0420   PUT #PRINTER_PATH, TOP_DOT
0421 NEXT K
0422 PRINT #PRINTER_PATH, CHR$(0);
0423
0424 (* GENERATE Y AXIS *)
0425
0426 PRINT #PRINTER_PATH, TAB(20);
0427 PRINT #PRINTER_PATH, CHR$(27); "K";
0428 PUT #PRINTER_PATH,EIGHT_DOTS
0429 PRINT #PRINTER_PATH,CHR$(0);
0430 FOR I:=1 TO 3
0431   PUT #PRINTER_PATH,EIGHT_DOTS
0432 NEXT K
0433
0434 (* CALCULATE FORMULA FLOT POINTS *)
0435
0436 INC:=INC+1
0437 UPPER:=200-(INC*8-2)
0438 LOWER:=UPPER-3
0439 FOR X_DOTS:=1 TO 252
0440   X_DOTS:=0
0441   X_VAL:=X_POS/X_FACTOR
0442   IF TYPE(SPAF)=3 THEN
0443     Y_POS:=A_VALUE+B_VALUE*X_VAL+C_VALUE*X_VAL*X_VAL
0444   ELSE
0445     Y_POS:=A_VALUE+B_VALUE*X_VAL+C_VALUE*X_VAL*X_VAL
0446   ENDIF
0447   Y_POS:=Y_FACTOR
0448   IF Y_POS < LOWER THEN
0449     GOTO 700
0450   ELSE
0451     IF Y_POS > UPPER THEN
0452       GOTO 100
0453     ENDIF
0454   ENDIF
0455   POWER_TWOS:=INT(Y_POS-LOWER)
0456   X_DOTS:=FLR(2*POWER_TWOS,X_DOTS)
0457
0458 (* CALCULATE SAMPLE POINTS *)
0459
0460 FOR L:=1 TO 8
0461   X_VAL:=-(L*2)*Y_FACTOR
0462   Y_POS:=HYB2(L)*Y_FACTOR
0463   IF X_DOTS=X_VAL+1 THEN
0464     IF Y_POS < LOWER THEN
0465       GOTO 500
0466     ELSE
0467       IF Y_POS > UPPER THEN
0468         GOTO 500
0469     ENDIF
0470   ENDIF
0471   POWER_TWOS:=INT(Y_POS-LOWER)
0472   X_DOTS:=FLR(2*POWER_TWOS,X_DOTS)
0473
0474 ELSE
0475   IF X_DOTS=X_VAL+1 THEN
0476     IF Y_POS < LOWER THEN
0477       GOTO 500
0478     ELSE
0479       IF Y_POS > UPPER THEN
0480         GOTO 500
0481     ENDIF
0482   ENDIF
0483   POWER_TWOS:=INT(Y_POS-LOWER)
0484   X_DOTS:=FLR(2*POWER_TWOS,X_DOTS)
0485
0486 ELSE
0487   IF X_DOTS=X_VAL+1 THEN
0488     FOR J:=1 TO 3
0489       M:=J-2
0490       IF Y_POS+M < LOWER THEN
0491         GOTO 400
0492       ELSE
0493         IF Y_POS+M > UPPER THEN
0494           GOTO 400
0495       ENDIF
0496     ENDIF
0497     POWER_TWOS:=INT(Y_POS+M-LOWER)
0498     X_DOTS:=FLR(2*POWER_TWOS,X_DOTS)
0499   NEXT J
0500 ENDIF
0501
0502 ENDIF
0503
0504 NEXT L
0505 PUT #PRINTER_PATH, X_DOTS
0506 NEXT Y_POS
0507 PRINT #PRINTER_PATH
0508 RETURN;

```

John J. Strunk



Mark Data Products

NEWS RELEASE

Mark Data Products has released a new order entry system for the Radio Shack Color Computer. This sales order processing system will give a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reports, and monitor receivables. An outstanding machine language program is included with the system to automatically enhance the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer, and one or more disc drives.

The MDP order entry system is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 500 transactions. When the operator selects a task to be performed, the computer loads a program designed to handle that task from the system disc. This modular design concept reduces the amount of memory used and simplifies what would otherwise be a very complex, unmanageable program. The system disc contains all of the programs required to create, update, and maintain data files and prepare the necessary paperwork including shipping and invoice forms, daily sales reports, a monthly (or other period) sales report and a receivables report.

The primary objectives of this order entry system were:

- * It must be accurate, user friendly and simple to use.
- * It must be easy to customize for specific user requirements.
- * All transactions must produce a traceable invoice.
- * It must handle receivables as well as closed orders.
- * It must be capable of future expandability.

This order entry software equals or exceeds higher priced packages for other computers and is available on disc with a detailed operating manual for just \$99.95. Order from your favorite dealer or direct from Mark Data Products, 24001 Alicia Parkway, #207, Mission Viejo, CA, 92691. Phone: (714) 768-1551.

24001 Alicia Pkwy. No. 207 • Mission Viejo, CA 92691 • (714) 768-1551

Color Computer Software

SUPER SLEUTH DISASSEMBLER Each \$99-FLEX

(specify for 680x/6502 or for Z80/8080/5)

Object-Only Version (680x/6502) \$50.00

For Color FLEX or OS/9 \$49.00

CoCo Sleuth \$49.00

CROSS-ASSEMBLERS Each \$50-FLEX

(specify for 6800/1,6805, 6502,Z80, or 8080/5) \$55-OS/9

DEBUGGING SIMULATORS Each \$75-FLEX

(specify for 6805 or 6502) \$100-OS/9

6502-TO-6809 ASSEMBLER XLATOR \$75-FLEX

\$85-OS/9

6800-9 & 6809 PIC XLATORS Both \$50-FLEX

\$75-OS/9

FULL SCREEN TSC XBASIC PROGRAMS FOR FLEX

(with full cursor control)

MAILING LIST \$100

INVENTORY/MRP \$100

TABULA RASA SPREADSHEET \$100

5.25" DSDD SOFT-SECTORED DISKETTES \$1.50 each in 50's

(with hub rings, Tyvek jackets, write-protect tabs, labels)

Computer Systems Consultants, Inc.

1454 Latta Lane

Conyers, Georgia 30207

404-483-1717/4570

Programs in source on 5"/8" disk.
Detailed printed manuals provided.

Call for catalog or dealer information.

VISA and MASTERCARD accepted. US Funds Only.

Add 5% Shipping.

Add \$4.00 per 50 Diskettes for Shipping.

* FLEX is a trademark of Technical Systems Consultants

* OS/9 is a trademark of Microware

LINKING LOADER

Part 2

Continued from Last Month

Using the
LINKING LOADER
with the
Radio Shack DOS

SETTING UP YOUR SYSTEM

The Loader Program must be copied to your program development diskettes, and the Linker Subroutine must be copied to your library diskettes. An undocumented feature of the Color Computer's DOS is the ability to copy from one diskette to another with only a Single Disk Drive. Type in the Copy command, but do not specify an output filename; for example, **COPY "LOADER.BIN"**. After the DOS loads the file, it will display a message to install the Destination Diskette. The name of the Linker module is **LINKER.BIN**.

You may also "LOADM" and "SAVEM" the loader.

SAVEM "LOADER",5H0000,5H12D7,5H0000

The Loader is written in Position Independent Code and will execute from anywhere in RAM. The buffer size will automatically be adjusted to suit the Program.

OPERATION

Type LOADM "LOADER", then EXEC, to load and execute the Loader.

INPUT AND OUTPUT FILES

The message "MAIN PROGRAM NAME, OUTPUT FILE NAME" will be displayed. Enter the name of the main module and the name of the output module, separated by a comma. If no output file is named, the output will be written back to the input file. The output module will contain the merged program ready to be loaded, linked, and executed. The default extension for all files is **BIN**.

DISPLAYING THE LOAD MAP

As the modules are loaded, a load map will be displayed. You may direct the map to the screen or the printer. The message "MAP TO SCREEN OR PRINTER(S/P)" will be displayed. Type S to display the map on the screen or P to print the map on the printer. The load map displays the load addresses of the modules, as well as the end address and transfer address of the program. The Loader automatically appends the Linker Module after loading the specified modules. The program's transfer address will be the linker's execution address, which will be included in the load map.

USING A LIBRARY DISKETTE

You may find it convenient to keep your subroutine library on its own diskette. If you have only one drive, you will have to swap diskettes after

the main module is loaded and before the output file is written. After the main module is loaded, the message "LOAD LIBRARY DISK AND HIT ENTER" will be displayed, and the Loader will pause and let you swap diskettes. After the last module is loaded, the message "LOAD OUTPUT DISK AND HIT ENTER" will be displayed, and once again the Loader will pause and let you swap diskettes.

BUFFER SIZE

On a 16K system, the buffer size is approximately 10,900 bytes. On a 32K system the buffer size is approximately 27,200 bytes. If you run out of buffer space, the message "OUT OF MEMORY" will be displayed, and the Loader will abort.

LINKING

Linking is the process of loading the execution addresses of the subroutines into a jump table so they can be located when the Program calls them.

The Linker module performs the linking in two passes. Pass 1 gets the entry point of each module and stores it in the jump table. The module's location on the jump table is at **2 * the Module Number**. If the jump table is at \$0E00, the entry point of module 3 will be at \$0E06. The Linker presented here loads the jump table at \$0E00 under RS DOS, but you can change it to fit your requirements.

Pass 2 calls the initialization routines of each module. The address of the vector is passed to the module in the Y register, in case you want to code jump tables in the modules

ACORN

COMPUTER SYSTEMS SS-50C

Color Computer

Stackable Modules		KIT	AMT
20 amp POWER SUPPLY w/fan			
w/Disk protect relay		350.00	400.00
DISK CABINET w/regs. & cables		200.00	250.00
1000 DRIVEs			
MOTHER BOARD, 8 SS-50c, 8 SS-30c		325.00	325.00
MMI button			
Item	Part	KIT	AMT
IT3	- INTERRUPT TIMER		
	1, 10, 100 per sec. 19.95	29.95	39.95
PR4	- INTELLIGENT PORT BUFFER		
	Single board comput. 39.95	114.95	139.95
DP1A	- Dual PIA parallel port		
	4 buffered I/Os 24.95	69.95	89.95
LADE	- Extended Addressing		
	BAUD gen. PIA port 29.95	69.95	89.95
MBS	- MOTHER BOARD SS-30c		
	w/BAUD gen. 64.95	149.95	169.95
P108	- 168K PROM DISK		
	21, 2764 EPROMs 39.95	79.95	109.95
PD88	- Firmware development		
	2, 8K blocks 39.95	84.95	114.95
IMPR	- 2764 PROM burner adapt.		
	for 2716 BURNER 19.95		
----- Color Computer -----			
MONOLINE	- 20 Mhz Monochrome		
	video driver 15.00	20.00	
CC30	PORT BUS w/power supply		
	5 SS-30, 2 Cart 180.95	180.95	189.95
POWER BOX	6 switched outlets		
	transient suppression 29.95	39.95	
RS-232	3-switched ports		
	for above ADD +20.00 +25.00		

11931 W. Bluemound Road
MILWAUKEE, WIS. 53226
(414) 257-0300

Write for FREE Catalog

ADD \$3.00 S&H PER ORDER
WIS. ADD 5% SALES TAX

26

Color Micro Journal

themselves. Typical code might be:

```
INIT LDX 4,Y ENTRY POINT FOR SUBROUTINE 2
STX SUB4,PCR
LDX 10,Y ENTRY POINT FOR SUBROUTINE 5
STX SUB10,PCR
RTS RETURN TO LINKER
```

To call the subroutine, use:

```
JSR [SUB4,PCR]
```

After linking, the Linker passes control to the Main Module's entry point (the entry location for the Program you are writing) as specified in the main module's preface.

The Source Code for the Loader and the Linker presented here was written for the TSC Macro Assembler which is supplied with some of the Color Computer FLEX Conversions, but should be compatible with most 6809 Assemblers which support Macros and Conditional Assembly.

The Loader calls ROM routines for File and Terminal I/O, so will probably only work with V1.1 BASIC, V1.0 Ex. BASIC, and V1.0 Disk BASIC ROM sets at this time. We would be interested in hearing from you if you change the calls over to the new ROMs.

ERROR MESSAGES

The loader displays two errors regarding memory overflow. Other messages are produced by BASIC.

OUT OF MEMORY

The buffer is full. Your program, plus the subroutines, are too big for the buffer.

NAME TABLE OVERFLOW

The subroutine name table has space for 30 entries. This message is displayed when the 31st is encountered. Don't forget that the Link Module will be added to your program.

The most common BASIC error message will probably be the "NE" error when you name a subroutine which is not stored on the disk. The **last entry** on the load map will be the erroneous name.

Using the
LINKING LOADER
with the
FLEX DOS

OPERATION

Type the entry
LOADER Input-File <Output-File>

INPUT AND OUTPUT FILES

If no output file is named, the output will be written to a file with the same name as the input file, with a CMD Extension. The output module will contain the merged program ready to be loaded, linked, and executed. The default extension for the input file is BIN. The default extension for the output file is CMD.

DISPLAYING THE LOAD MAP

As the modules are loaded, a load map will be displayed (which can easily be directed to a Printer or File under FLEX). The load map displays the load addresses of the modules, as well as the end address and transfer address

of the program. The Loader automatically appends the Linker Module after loading the specified modules. The program's transfer address will be the linker's execution address, which will be included in the load map.

BUFFER SIZE

On a 16K system, the buffer size is approximately 14,000 bytes, while on a 32K system the buffer size is approximately 30,000 bytes. On a 48K system the buffer size is approximately 46,000 bytes. If you run out of buffer space, the message "OUT OF MEMORY" will be displayed, and the Loader will abort.

LINKING

Linking is the process of loading the execution addresses of the subroutines into a jump table so they can be located when the Program calls them.

The linker module performs the linking in two passes. Pass 1 gets the entry point of each module and stores it in the jump table. The module's location in the jump table is at the **Module Number * 2**. If the jump table is at \$BF00, module #3's entry point will be loaded at \$BF06.

Pass 2 calls the initialization routines of each module. The address of the vector is passed to the module in the Y register, in case you want to code the jump table in the module itself. Typical code might be:

```
INIT LDX 4,Y ENTRY POINT FOR SUBROUTINE 2
STX SUB4,PCR
LDX 10,Y ENTRY POINT FOR SUBROUTINE 5
STX SUB10,PCR
RTS RETURN TO LINKER
```

To call the subroutine use:

```
JSR [SUB4,PCR]
```

After linking, the Linker passes control to the main module's entry point as specified in the main module's preface.

The source code for the Linker and the Loader is written for the TSC Macro Assembler. Programs to run under either FLEX or Radio Shack DOS can be generated. Make your selection with the command line parameter &A. Use 'F' to select FLEX, or use 'R' to select Radio Shack, as shown;

ASMB LOADER +F for FLEX
ASMB LOADER +R for Radio Shack

ERROR MESSAGES

The loader displays two error messages regarding memory overflow; other messages are produced by FLEX.

OUT OF MEMORY

The buffer is full. Your program plus the subroutines are too big for the buffer.

NAME TABLE OVERFLOW

The subroutine name table has space for 30 entries. This message is displayed when the 31st is encountered. Don't forget that the Link Module will be added to your program.

If you get a **FILE NOT FOUND** message from FLEX, the last entry on the load map will be the erroneous name.

Roland Waggoner

```
OPT PAG
NAM LOADER
IFC '&A', 'R'
STTL RS DOS VERSION 1.0
ELSE
STTL FLEX VERSION 1.0
ENDIF
PAG
```

```
#####
# LOADER PROGRAM FOR THE RADIO SHACK #
# COLOR COMPUTER, with or w/o FLEX #
# #
# COPYRIGHT (C) 1983 ROLAND WAGGONER #
# and Computer Publishing Inc. #
# #
#####
# USE THE COMMAND LINE PARAMETER &A TO INDICATE #
# A FLEX OR A RADIO SHACK BASIC ASSEMBLY. #
# USE F FOR FLEX. #
# USE R FOR RS BASIC. #
# #
#####
```

```
#
# MACRO TO DEFINE OUTPUT STRING FOLLOWED BY #
# A TERMINATOR. THE TERMINATOR IS $00 FOR #
# RS DOS, OR $04 FOR FLEX #
#
PSTRNG MACRO
IFC '&A', 'R'
FCC '&1', '$00
ELSE
FCC '&1', '$04
ENDIF
ENDM
```

```
#
# MACRO TO CALL GET CHARACTER FROM FILE #
# ROUTINE. IF ASSEMBLED FOR RS DOS THEN #
# JUST JSR GETCHR(?). IF ASSEMBLED FOR #
# FLEX THE LBSR RCHR WHICH CALLS FMS AND #
# DOES ERROR CHECKING. #
#
RDCHR MACRO
IFC '&A', 'R'
JSR GETCHR
ELSE
LBSR RCHR
ENDIF
ENDM
```

OS-9* SOFTWARE

SYSTEM UTILITIES AND
APPLICATION PROGRAMS
FOR USE WITH THE OS-9
OPERATING SYSTEM.
PROGRAMS DEVELOPED ON
LARGER OS-9 SYSTEMS NOW
BEING TRANSPORTED TO
THE COCO. SEND A SELF-
ADDRESSED STAMPED
BUSINESS SIZE ENVELOPE
FOR THE LATEST DETAILED
LISTING.

D.P. Johnson
7655 S.W. Cedarcrest St.
Portland, OR 97223

* OS-9 is a trademark of Microware and Motorola Inc.

* -- Radio Shack ORG and EQUates
*
* IFC 'A', 'R'
* ORG \$E88 To get above Disk DOS
* EQU'S
*
* TXTOUT EQU \$B99C OUTPUT TEXT STRING
* TXTIN EQU \$A398 INPUT TEXT STRING
* TERMIF EQU \$0200 TERMINAL INPUT BUFFER
* DFLTD EQU \$095A ADDRESS OF DEFAULT DISK
* DFLTDD EQU \$EB DRIVE NUMBER FOR OPEN
* FNBLUFF EQU \$94C DOS' FILENAME BUFFER
* FTTYPE EQU \$951 ADDRESS OF FILE TYPE AND FORMAT
* SETOPN EQU \$C844 OPEN SETUP ROUTINE
* OPEN EQU \$C468 OPEN A FILE
* DEVNO EQU \$6F DEVICE NUMBER ADDRESS
* SCROUT EQU \$A36A OUTPUT CHR TO SCREEN
* GETCHR EQU \$A176 GET CHARACTER FROM DEVICE
* POLCAT EQU \$A1C1 POLL KEYBOARD
* CHROUT EQU \$A282
* PUTCHR EQU CHROUT
* FRLEN EQU \$97C ADDRESS OF FILENAME LENGTH
* CLOSE EQU \$C453 CLOSE A FILE
* CLOSEM EQU \$C43B CLOSE ALL OPEN FILES
* BLANK EQU \$20
* CR EQU \$8D CARRIAGE RETURN
* BREAK EQU \$83 BREAK KEY
* FNLEN EQU 11 FILENAME LENGTH
* ENDIF
*
* *****
* -- FLEX System EQUates
*
* IFC 'A', 'F'
* EQU'S
*
* TXTIN EQU \$CD01B INPUT TEXT STRING
* OUTADR EQU \$CD45 OUTPUT HEX VALUE
* TXTOUT EQU \$CD01E OUTPUT TEXT STRING
* MEMEND EQU \$C028 END OF MEMORY & BUFFER
* DRNUM EQU \$CC0C WORKING DRIVE NUMBER
* FNBLUFF EQU \$FCB+3
* GETCHR EQU \$D486 GET CHR FROM FILE
* INCH2 EQU \$CD0C INPUT CHR FROM TERMINAL

DUTCH2 EQU \$CD12 OUTPUT CHR TO TERMINAL
CLOSEM EQU \$D483 CLOSE ALL FILES
FMS EQU \$D486 FMS CALL
CLOSE EQU FMS
FNLEN EQU 12 FORMATTED FILENAME LENGTH
WARM5 EQU \$CD03 RETURN TO FLEX
INCH EQU \$CD09 INPUT CHR FROM KEYBOARD
PUTCHR EQU \$CD18 OUTPUT CHARACTER
CRLF EQU \$CD24 PRINT CR LF
POLCAT EQU \$CD4E KEYBOARD STATUS
BFFTR EQU \$CC14 INPUT BUFFER POINTER
CHROUT EQU FMS OUTPUT CHR TO FILE
GETFIL EQU \$CD20 PARSE FILENAME
SETEXT EQU \$CD33 SET DEFAULT EXTENSION
LSTRM EQU \$CC11 LAST TERMINATOR
NXTCH EQU \$CD27 GET NEXT CHR FROM INPUT BUFFER
RPTERR EQU \$CD3F REPORT FILE ERROR
EOL EQU \$CC02 COMMAND DELIMITER
CR EQU \$8D CARRIAGE RETURN
BLANK EQU \$20
ENDIF
*

* Was a valid System requested
* for Assembly?
*
* IFC 'A', 'R'
* IFC 'A', 'F'
* ERR NOT VALID SYSTEM CODE
* ENDIF
*
* If assembly is for FLEX, set the ORG
* at \$200 because the FLEX DEBUG
* Program uses interrupts, which the
* BASIC ROM vectors to the \$100 area.
* Can be ORG'd at \$80 if
* DEBUG will not be used.
*
* IFC 'A', 'F'
* ORG \$8200
* ENDIF

LOADER EQU *
* If assemble for Radio Shack
*
* IFC 'A', 'R'
* STS BASSTK,PCR SAVE BASIC'S STACK FOR RETURN
* LEAX -50,S MARK END OF BUFFER
* STX MEMEND,PCR
* LEAX BUFFER,PCR ADDRESS OF PROGRAM BUFFER
* STX BUFFAD,PCR
* LEAX MSG1,PCR FILENAME PROMPT
* LBSR INPUTP GET INPUT AND OUTPUT FILENAMES
* SET UP TO LOAD MAIN PROGRAM
* LDA #1, COMMA
* LBSR INCHR FIND DELIMITER
* PSHS A,X SAVE DELIMITER AND POINTER
* LEAY MODTAB,PCR SET UP TO MOVE FILENAME TO TABLE
* LDX #TERMIF KEYBOARD BUFFER
* LBSR PARSEN PARSE FILENAME AND MOVE TO TABLE
* LDA #FFF MARK END OF TABLE
* STA MODTAB+12,PCR
* PULS A,X GET DELIMITER AND POINTER
* TSTA WAS DELIMITER ZERO?
* BNE LINKR1 GO IF NOT

* IF ONLY ONE FILE SPECIFIED, LINKED PROGRAM IS
* COPIED BACK TO MAIN FILE, SO PARSED FILENAME
* IS COPIED BACK TO OUTPUT FILENAME
* LEAU OUTFN,PCR OUTPUT FILENAME STORE
* LEAX MODTAB,PCR
* LDB #12 MOVE 12 BYTES
* LBSR MOVEM COPY FILENAME
* BRA MAPDSP

* PARSE OUTPUT FILENAME AND SAVE
* LINKR1 LEAX 1,X SKIP DELIMITER
* TFR X,Y SAVE POINTER
* LBSR LENSTR COUNT BYTES
* TFR Y,X RESTORE POINTER
* LEAY OUTFN,PCR ADDRESS OF OUTPUT FILENAME
* LBSR PARSEN PARSE AND STORE OUTPUT FILENAME

* ASK WHERE MAP SHOULD BE DISPLAYED
* MAPDSP LEAX MSG2,PCR PRINT PROMPT
* LBSR INPUTP GET INPUT
* CLR DSPDWC,PCR SET SCREEN DEFAULT
* LDA ,X SET INPUT
* CMPA #'P' WAS PRINTER SPECIFIED?
* BNE LOAD GO IF NOT
* LDA #2 ELSE SET PRINTER
* STA DSPDWC,PCR DEVICE
* LEAX MSG7-1,PCR PRINT TITLE
* STA DEVNO
* JSR TXTOUT OUTPUT THE TITLE
* LDA #CR FOLLOWED BY 2 CR'S
* JSR CHROUT
* LDA #CR
* JSR CHROUT
* ENDIF

* End of Radio Shack portion

* If assemble is for FLEX
* IFC 'A', 'F' FLEX CODE

BRA LOADS SKIP VERSION NUMBER
VN FCC 1 VERSION 1
LOADS EQU *
JSR CRLF
LEAX BUFFER,PCR ADDRESS OF BUFFER
STX BUFFAD,PCR FOR COMPARES
LDA DRNUM INITIALIZE DRIVE NUMBER
STA LNKNM
* GET FILENAMES FROM INPUT BUFFER
LEAX SFCB,PCR FCB
JSR GETFILE PARSE FILENAME
LBCS FERR GO IF FILENAME ERROR
CLRA .BIN EXTENSION
JSR SETEXT SET DEFAULT EXTENSION
LEAX SFCB+3,PCR ADDRESS OF PARSED FILENAME
LEAU MODTAB,PCR MODULE TABLE
LDB #12 MOVE 12 BYTES
LBSR MOVEM MOVE NAME TO TABLE
LDA #FF MARK END OF TABLE
STA ,U
* NOW CHECK FOR OUTPUT FILENAME. IF THERE
* IS ONE SPECIFIED PARSE IT AND SAVE IT.
* IF ONE IS NOT SPECIFIED, COPY THE INPUT
* FILENAME, BUT SET THE EXTENSION TO CMD
*
* LDA LSTRM LAST TERMINATOR
* CMPA #CR CARRIAGE RETURN?
* BEQ OUTF GO IF SO
* CMPA EOL COMMAND SEPARATOR?
* BEQ OUTF GO IF SO
* CMPA #BLANK BLANK
* BEQ OUTF GO IF SO
*
* GET OUTPUT FILENAME FROM INPUT BUFFER
* LEAX SFCB,PCR FCB
* JSR GETFILE GET FILENAME
* LDA #2 CMD DEFAULT EXTENSION
* JSR SETEXT SET DEFAULT
* LEAX SFCB+3,PCR ADDRESS OF PARSED FILENAME
* LEAU OUTFN,PCR STORAGE AREA
* LDB #12 MOVE 12 BYTES
* LBSR MOVEM MOVE NAME TO STORAGE
* BRA LOAD GO START LOAD
* OUTF LEAX MODTAB,PCR COPY INPUT NAME
* OUTF1 LEAU OUTFN,PCR OUTPUT FILENAME STORAGE
* LDB #9 MOVE 9 BYTES
* LBSR MOVEM GO MOVE IT
* LEAX CMST,PCR ADDRESS OF 'CMD'
* LDB #3 MOVE 3 BYTES
* LBSR MOVEM MOVE EXTENSION
* ENDIF
* End of FLEX portion

*
* START LOADING MODULES ON MODTAB LIST. THE FIRST
* MODULE IS THE MAIN MODULE. AFTER EACH MODULE IS
* LOADED, ANY EXTERNAL REFERENCES ARE ADDED TO THE
* END OF THE LIST IF THEY ARE NOT ALREADY ON THE
* LIST
*
* LOAD CLR MODCNT,PCR MAIN MOD FLAG
* LEAX BUFFER,PCR BEGINNING OF PGM BUFFER
* STX LOADD,PCR
* STX RECALL,PCR INITIALIZE RECORD LOAD ADDRESS
* LEAX MODTAB,PCR TABLE INDEX
* STX MODTBP,PCR FIRST ENTRY POINTER
* STX TABEND,PCR LAST ENTRY POINTER
* LOAD1 EQU * START THE LOAD

* if Radio Shack
* IFC 'A', 'R'
* LBSR CKBRK CHECK IF BREAK KEY IS PRESSED
* ENDIF

* OPEN THE FILE
*
* if FLEX
* IFC 'A', 'F'
* LEAX 1,X SKIP DRIVE NUMBER
* ENDIF

LBSR DSPMOD GO DISPLAY THE MODULE NAME
* if FLEX
* IFC 'A', 'F'
* LEAX -1,X RESTORE FILENAME POINTER
* ENDIF

* if RS
* IFC 'A', 'R'
* LDA #1 INPUT FILE
* LDB #1 DEVICE NUMBER
* ELSE
* if not, then FLEX
* LDA #1 OPEN FOR INPUT
* ENDIF

LBSR SOPEN GO OPEN THE FILE
* CLR RECFLG,PCR 1ST RECORD FLAG
* if RS
* IFC 'A', 'R'



KEYBOARD HELPS FAMILIARIZE CHILDREN WITH THE LOCATION OF COMPUTER KEYS. THE GRAPHIC KEYBOARD ENABLES THE USER TO FIND KEYS QUICKLY. HOME KEYS ARE IDENTIFIED AND PROPER FINGERING MAY BE TAUGHT TO OLDER CHILDREN. LESSONS ARE BUILT AROUND ALPHABET PRESENTATIONS AND LETTER DRILLS WITH A GRAPHIC REWARD COMPLETING EACH LESSON. WHILE YOUNG CHILDREN ENJOY KEYBOARD'S LETTER RECOGNITION ACTIVITIES, ADULTS MAY BRUSH UP ON RUSTY TYPING SKILLS. THE 32K VERSION HAS LENGTHIER TIMED DRILLS. DATA TAPE USE IS OPTIONAL WITH BOTH 16K AND 32K VERSIONS. ANY DATA TAPE MADE FOR B5'S SPELLING OR HANGWORD/SCRAMBLE PROGRAMS MAY BE USED WITH KEYBOARD, OR USE KEYBOARD PHONIC DRILL DATA TAPE. (SEE BELOW)

16K Cassette - \$19.95 / 32K Cassette - \$24.95 / 32K Disk - \$26.95

KEYBOARD Phonic Drill Data Tape - \$8.95

INTEGRATE LEARNING WITH USE OF THIS DATA TAPE AND KEYBOARD PROGRAM. STUDENTS TYPE LETTER, WORD, AND SENTENCE DRILLS USING COMMON VOWEL AND CONSONANT COMBINATIONS. REINFORCE PHONIC STRUCTURES WHILE LEARNING THE KEYBOARD. MUST BE USED WITH KEYBOARD PROGRAM (ABOVE). MAY NOT BE USED ALONE.

For use with TRS-80 Color Computer* & TDP-100*
with Extended Basic

ASK FOR DEALER DEMONSTRATION TODAY!

Brochure describing other fine
B5 programs available upon request.

*Reg. trademark Tandy Corp.

If unavailable locally,

order direct.

(OH Res. add

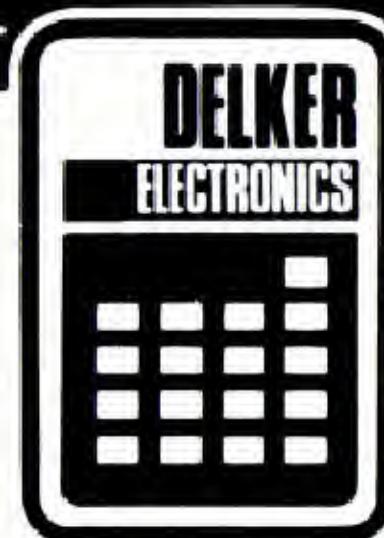
5% Sales Tax)

1024 Bainbridge Pl. • Columbus, Ohio 43228 • (614) 276-2752

CoCo HEADQUARTERS

Looking to unlock the capacity of your Color Computer?
Search no more.....

TOLL FREE
1-800-251-5008



SPECIALS

1.1 Extended Basic w/bk	\$ 69.95	26-3026 Color Computer 2 16k	\$ 149.95
64k Memory Upgrade	\$ 59.95	26-3026E Extended CoCo 2 16k	\$ 224.95
RS 1.1 Disk Controller	\$ 149.95	26-3003 64k Extended CoCo	\$ 329.95
1.2 Color Basic Rom	\$ 29.95	26-3011 MC-10 CoCo	\$ CALL
Amdek Disk Drives	\$ 499.95	26-1261 TP-10 Thermal Printer	\$ 89.95
26-3022 CoCo Drive 0	\$ 349.95	26-1192 CGP-115 Printer/Plotter	\$ 179.95
26-3029 CoCo 2 Drive 0	\$ 349.95	C. Itoh Banana Serial 50 cps	\$ 249.95
26-3023 Drive 1	\$ 239.95	C. Itoh Prowriter 8510 (par)	\$ 399.95
Super Pro Keyboard Kit	\$ 64.95	26-1268 CGP-220 Color Jet Ptr.	\$ 639.95
26-3016 RS Keyboard kit	\$ 34.95	26-3024 RS Multi-Pac Interface	\$ 149.95

ACCESSORIES

RS D.C. Modem IB	\$ 89.95	Elephant Disks ssdd	\$ 22.95
Novation J-Cat Modem	\$ 129.95	Verbatim Disks ssdd	\$ 27.95
RS D.C. Modem II	\$ 179.95	Kraft Joystick	\$ 39.95
Hayes SM 300 Modem	\$ 239.95	CoCo Switcher	\$ 39.95
USR Password 300/1200	\$ 449.95	26-3020 4 pin DIN cable	\$ 5.29
Hayes/USR/Banana cables	\$ 19.95	Botek ser/par Interface	\$ 69.95

SOFTWARE & BOOKS

OS-9 (req. 64k)	\$ 64.95 (Disk)	Color Computer Graphics	\$ 5.95
Basic-09 (req. OS-9)	\$ 89.95 (Disk)	CoCo Assembly Prog.	\$ 6.95
Color Logo	\$ 44.95 (Rom)	CoCo Programs	\$ 9.95
MSI Diskutil	\$ 19.95 (Disk)	101 CoCo Programs	\$ 9.95
MSI Maillist	\$ 24.95 (Disk)	Programming the 6809	\$ 14.95
MSI Color Finance	\$ 49.95 (Disk)	Basic Faster and Better	\$ 29.95
Elite-Calc	\$ 44.95 (C or D)	Pooyan by Konami (32k)	\$ 34.95 (C & D)
Colorcom/E	\$ 49.95 (Disk)	Sea Dragon (32k)	\$ 34.95 (C or D)

TOLL

Call for prices and availability of your other favorite software

FREE

All advertised items subject to availability

TENNESSEE

1-800-545-2502

All of the above units covered by our 120 day carry in warranty.

TRS-80 Trademark Tandy Corporation. Prices subject to change without notice.

Write for our FREE newsletter!

TOLL

FREE

1-800-251-5008

DELKER ELECTRONICS, INC.
P.O. BOX 897 DEPT D
SMYRNA, TN 37167
800-251-5008
800-545-2502 (TENNESSEE)
615-459-2636 (TENNESSEE)
615-254-0088 (NASHVILLE)

FACTORY DIRECT
PURE RADIO SHACK EQUIPMENT
"THE COCO PROFESSIONALS"



```

LDB #1 FILE DEVICE NUMBER
STA DEVNO
ENDIF

LOAD2 JSR GETCHR GET FLAG BYTE

* if RS
* IFC '&A', 'R'
TSTA TEST FOR EOF
LBLT LOADF GO IF EOF RECORD
RDCHR SET MSB OF RECORD LENGTH
STA ,--S SAVE
RDCHR LSB
STA 1,S
RDCHR MSB OF LOAD ADDRESS
STA ,--S
RDCHR LSB
STA 1,S
ELSE

* else, assemble for FLEX
* BEQ LOAD22 GO IF NO ERROR
LDA 1,X GET ERROR CODE
CMPA ##8 EDF
LREQ LOADF GO IF SO
LBR4 FERR ELSE REPORT ERROR AND ABORT
LOAD22 CMPA ##16 TRANSFER ADDRESS RECORD?
LBEQ LOADF GO IF SO
LEAS -4,S RESERVE SPACE FOR RECORD CONTROL
RDCHR MSB OF LOAD ADDRESS
STA ,S
RDCHR LSB
STA 1,S
CLR 2,S MSB OF LENGTH
RDCHR GET LENGTH
STA 3,S
ENDIF

TST MODCNT,PCR IS IT MAIN?
BNE LOAD3 GO IF NOT
TST RECFLG,PCR 1ST RECORD?
BNE LOAD4 GO IF NOT
* 1ST RECORD OF MAIN MODULE HAS THE SAVED LOAD
* ADDRESS
LDD 5 LOAD ADDRESS
STD PGMAADD,PCR SAVE FOR OUTPUT LATER
LBSR DSPADD DISPLAY IT
LDD LDADD,PCR MEMORY LOAD ADDRESS
SUBD ,S OFFSET TO ADD TO LOAD ADDRESS
STD OFFSET,PCR FOR STORING SUBSEQUENT RECORDS
STD OFFST1,PCR FOR DISPLAYING LOAD ADDR. OF MOD
INC RECFLG,PCR SET NOT FIRST TIME FLAG
BRA LOAD4
LOAD3 LDD LDADD,PCR OFFSET FOR SUBROUTINES IS THE
STD OFFSET,PCR LOAD ADDRESS
STD RECALL,PCR INITIALIZE RECORD LOAD ADDRESS
TST RECFLG,PCR IS IT FIRST RECORD?
BNE LOAD4 GO IF NOT
SUBD OFFST1,PCR DISPLAY EXECUTION LOAD ADDRESS
LBSR DSPADD

* if RS
* IFC '&A', 'R'
LDB #1 UPDATE THE FILE DEVICE NUMBER
STA DEVNO
ELSE

* else FLEX
* LEAX SFCB,PCR RESTORE FCB ADDRESS
ENDIF

PULS D GET ADDRESS AGAIN
ADD offset,PCR ADD OFFSET
STD RECALL,PCR SAVE
TFR D,Y INDEX FOR STORING
PULS D LENGTH
ADD RECALL,PCR CALCULATE END ADDRESS
SUBD #1
STD ENDADD,PCR

* if FLEX
* IFC '&A', 'F'
CMPO MEMEND,PCR CHECK OUT OF MEMORY
ELSE

* else, RS
* CMPO MEMEND,PCR CHECK OUT OF MEMORY
ENDIF

LBHI NOMEM GO IF OUT OF MEMORY
LOADS EQU *
RDCHR GET BYTE
STA ,Y+ SAVE BYTE
CMPP ENDADD,PCR DONE?
BLS LOADS LOOP IF NOT
LBR4 LOAD2 GET NEXT RECORD
LOADF EQU * END OF FILE PROCESSING
LDB #3 OFFSET INTO PREFACE POINTING
* TO END OF MOD
LBSR GETADD GET END OF JUST LOADED MODULE
STX PGMTOP,PCR END OF PROGRAM

* if RS
* IFC '&A', 'R'
TST MODCNT,PCR MAIN MODULE
BNE LOAD4 GO IF NOT
LEAX MSG4,PCR CHANGE DISK MESSAGE
LBSR INPUTP
ENDIF

* now start copying any external references to the
* module table
* FIRST CLOSE THE FILE
LOADC EQU *

* if RS
* IFC '&A', 'R'
LDB #1 REFRESH FILE NUMBER
STA DEVNO
ELSE

* else FLEX
* LEAX SFCB,PCR FCB
LDB #4 CLOSE FUNCTION
STA ,X STORE IN FCB
ENDIF

JSR CLOSE
LDB #5 OFFSET INTO PREFACE WHICH POINTS
* TO RELATIVE ADDRESS OF MODULE
* NAMES
LBSR GETADD GET ADDRESS OF MODULE NAMES
BEQ LOAD4 GO IF NO EXTERNS NAMED
LOADC1 PSHS X SAVE POINTER
LEAY TEMP,PCR MOVE NAME TO TEMP. FOR COMPARE
LBSR PARSEPARSE FILENAME

* SEARCH TABLE TO SEE IF MODULE ALREADY LOADED
LEAY TEMP,PCR ADDRESS OF NAME
LEAX MODTAB,PCR
LDB #12 12 BYTE ENTRIES
LBSR SEARCH SEARCH TABLE
BEQ LOAD4 GO IF ITEM ALREADY IN TABLE

* COPY NAME FROM BUFFER TO TABLE
LDD TABEND,PCR ADDRESS OF END OF TABLE
LEAU 12,U POINT TO NEXT ENTRY
STD TABEND,PCR

* if RS
* IFC '&A', 'R'
LDX FNBLUFF DOS BUFFER
ELSE

* else FLEX
* LEAX FNBLUFF,PCR DOS BUFFER
ENDIF

LDB #FNLEN MOVE FILENAME
LBSR MOVMEM GO MOVE FILENAME

* if RS
* IFC '&A', 'R'
LDA DFLTDD DRIVE NUMBER
STA ,U+
ENDIF

CMPO BUFFAD,PCR TABLE FULL?
LBHS NOTAB GO IF YES
LEAX LNKNAME,PCR LINKEIR FILENAME
LDB #12 MOVE 12 BYTES
LBSR MOVMEM MOVE LINKEIR FILENAME TO END OF TABLE
LDA ##FF MARK END OF BUFFER
STA ,U
LOADC2 PULS X RESTORE POINTER TO MODULE'S TABLE
LBSR LENSTR GET POINTER TO NEXT ITEM
LEAX ,X SKIP MARK
TST X TEST FOR END OF TABLE
BGT LOADC1 GO GET NEXT ITEM

* LOAD NEXT ITEM ON LOAD LIST
* LOADN INC MODCNT,PCR RESET MAIN MOD FLAG
LDX MODTBIP,PCR TABLE INDEX
LEAX 12,X POINT TO NEXT ENTRY
TST ,X END OF TABLE?
BLT BINDOUT GO START OUTPUT IF SO
STX MODTBIP,PCR UPDATE POINTER
LDA PGMTOP,PCR END OF LAST MODULE
STX LDADD,PCR
LDX MODTBIP,PCR POINT TO FILENAME
LBR4 LOAD1 START LOADING MODULE

* LAST MODULE LOADED - START OUTPUT
* BINDOUT EQU +
* if RS
* IFC '&A', 'R'
LBSR CKBRK CHECK IF BREAK KEY IS PRESSED
ENDIF

* MOVE LOAD MAIN'S ADDRESS TO LINKER
LDD LDADD,PCR LINKER'S LOAD ADDRESS
SUBD OFFST1,PCR ULTIMATE LOAD ADDRESS
PSHS D SAVE
LDD PGMAADD,PCR MAIN'S LOAD ADDRESS
SUBD ,S OFFSET FROM LINKER TO MAIN
LDX LDADD,PCR LINKER ADDRESS
STD 1,X STORE OFFSET TO MAIN IN LINKER'S PREFACE
PULS ,X LINKER'S LOAD ADDRESS
LEAX 9,X PGM EXECUTION ADDRESS
STX XADD,PCR SAVE FOR BINARY FILE

* DISPLAY THE TRANSFER ADDRESS
* LEAX MSG8,PCR 1ST 8 CHARACTERS
LBSR DSPMOD

* if FLEX
* IFC '&A', 'F'
LDA #BLANK SPACE BETWEEN WORDS
JSR PUTCHR
ENDIF

LEAX MSG8+8,PCR 2ND 8 CHARACTERS
LBSR DSPMOD
LDD XADD,PCR TRANSFER ADDRESS
LBSR DSPADD DISPLAY IT

* DISPLAY THE END ADDRESS
LEAX MSG6,PCR 'END'
LBSR DSPMOD
LDD PGMTOP,PCR ADDRESS
SUBD OFFST1,PCR CALCULATE ULTIMATE LOAD ADDRESS
LBSR DSPADD GO DISPLAY IT

* COPY FILENAME TO DOS BUFFER
* if RS
* IFC '&A', 'R'
LEAX MSG5,PCR CHANGE DISK MESSAGE
LBSR INPUTP
LEAX OUTFN,PCR OUTPUT FILENAME
LDA #0 OUTPUT FILE
LDB #1 FILE DEVICE NUMBER
LDY ##200 M/L BINARY FILE TYPE
ELSE

* else for FLEX
* LEAX OUTFN,PCR NAME OF OUTPUT FILENAME
LDA #2 OPEN FOR OUTPUT
ENDIF

LBSR SOPEN GO OPEN THE FILE

* SET UP POINTERS, ETC
LDX PGMTOP,PCR END OF PROGRAM
CLR ,X LAST MODULE MUST END WITH ZERO

```

COLOR COPY

COLCOPY is a menu driven copy utility that copies data files or programs: disk to tape, tape to disk or disk to disk. It also kills files or programs.

Many options are provided: copies basic programs, machine language programs or data files, allows selection by groups of filenames or extensions, individual files by menu selection, writes multiple copies of files to tape, backup a disk to tape, restore a disk from tape, copies files in alphabetic sequence and much more.

Written in basic with machine language subroutines. Includes program on cassette and instructions.

Requires 32K, DOS. ONLY \$15pp

CASSETTE DIRECTORY

REVISED! Displays hex addresses to printer or screen. Still only \$2.50 or FREE with any product -ask for it!

FREE CATALOG with order or send self addressed stamped envelope.

Send check or money-order to:

COCOPRO
P.O. BOX 37022
ST. LOUIS, MO 63141

Postage paid on all pre-paid orders in U.S.
Missouri residents add 5.625 percent sales tax.

DEALER INQUIRIES INVITED

Continued next month

'68'

MICRO JOURNAL

\$2.95 USA

Australia	A \$ 4.75	New Zealand	NZ \$ 6.50
Singapore	S \$ 9.45	Hong Kong	H \$23.50
Malaysia	M \$ 9.45	Sweden	30:-SEK

You have HEARD about FLEX(tm); now LEARN about FLEX.
Subscribe to the '68' Micro Journal!

You have HEARD about the power of the 6809 Computer Chip
in your Color Computer; now LEARN how to use this power.
Subscribe to the '68' Micro Journal!

You have HEARD about the "Multi-User, Multi-Tasking" UNIX(tm) style
Operating Systems (such as OS-9(tm) and UniFLEX(tm)); now LEARN about them.
Subscribe to the '68' Micro Journal!

You have HEARD about all the Software available for the 68xx Series Based
Computer Systems; now LEARN about this Software AND the Computer Systems.
Subscribe to the '68' Micro Journal!

'68' Micro Journal provides INFORMATION thru:

Regular MONTHLY Columns like "FLEX Users Notes" by Ron Anderson, "OS-9 Users Notes" by Peter Dibble, "C Users Notes" by Norm Commo, "Color Users Notes" by Bob Nay, etc.

Regular MONTHLY Features like the "Bit Bucket", Reviews, Articles, Programs, etc., covering Software Development, Business Use, Operating System operation, hints, etc.

DON'T MISS A SINGLE ISSUE; SUBSCRIBE NOW!

SUBSCRIPTION RATES

OK, PLEASE ENTER MY SUBSCRIPTION

Bill My: Master Charge — VISA

Card # _____ Exp. Date _____

For 1-Year 2 Years 3 Years

Enclosed: \$ _____

Name _____

Street _____

City _____ State _____ Zip _____

My Computer Is: _____

68 Micro Journal
5900 Cassandra Smith Rd.
Hixson, TN 37343

USA
1 Year \$24.50, 2 Year \$42.50, 3 Year \$64.50
*FOREIGN SURFACE Add \$12.00 per Year to USA Price
*FOREIGN AIRMAIL Add \$36.00 per Year to USA Price
**CANADA & MEXICO Add \$5.50 per Year to USA Price
Cash (USA) or drawn on a USA Bank!!!



